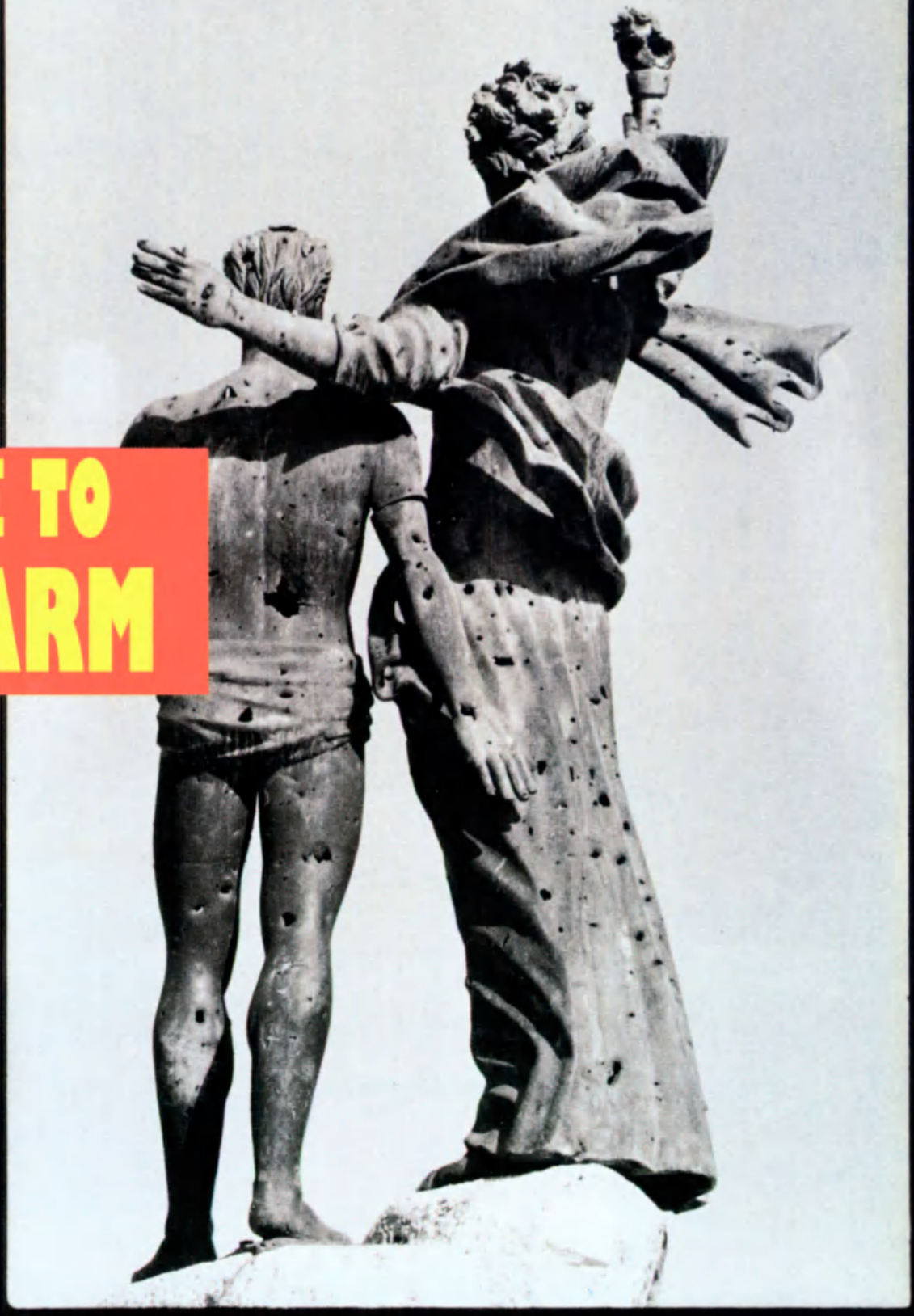
The UNESCO COURIER

OCTOBER 1993

INTERVIEW WITH JAMES D. WATSON



TIME TO DISARM

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ENCOUNTERS

We invite readers to send us photographs to be considered for publication in this feature. Your photo should show a painting, a sculpture, piece of architecture or any other subject which seems to be an example of cross-fertilization between cultures. Alternatively, you could send us pictures of two works from different cultural backgrounds in which you see some striking connection or resemblance. Please add a short caption to all photographs.

HEAD OF IAÔ

1989,
construction in wrought iron on a stone base (57 x 20 x 28 cm)
by Ronaldo Pereira Rego

Rego is a Brazilian painter, engraver and sculptor whose work is influenced by Umbanda, *a syncretic Afro-Brazilian religion in which the forces of nature are worshipped. Rego sees profound resemblances between the divinities of* Umbanda *and those of other religions, and has been inspired by these unexpected analogies to make constructions which he calls* mocans *(talismans). Shown here is a head of Iaô, a priestess of the* Umbanda *goddess of air, storms and flashes of lightning, whom Rego connects with St. Barbara, a Christian saint invoked in thunderstorms, and with Shu, the ancient Egyptian god of air and light.*

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Beirut (Lebanon).

Special consultant for this issue:
Dominique David

The UNESCO COURIER

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"The Governments of the States parties to this Constitution on behalf of their peoples declare,
"that since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed...
"that a peace based exclusively upon the political and economic arrangements of governments would not be a peace which could secure the unanimous, lasting and sincere support of the peoples of the world, and that the peace must therefore be founded, if it is not to fail, upon the intellectual and moral solidarity of mankind.
"For these reasons, the States parties ... are agreed and determined to develop and to increase the means of communication between their peoples and to employ these means for the purposes of mutual understanding and a truer and more perfect knowledge of each other's lives...."
EXTRACT FROM THE PREAMBLE TO THE CONSTITUTION OF UNESCO, LONDON, 16 NOVEMBER 1945

James D. Watson

talks to Serafín García Ibáñez

The American geneticist and biochemist James Dewey Watson is one of the pioneers of research into molecular biology. Keenly interested in crystallography, his investigation of ribonucleic acid led him to tackle the mystery of DNA (deoxyribonucleic acid), whose double helix structure he unraveled, with Francis Crick, in 1953. For this major scientific discovery of the twentieth century James Watson, Francis Crick and Maurice Wilkins were awarded the 1962 Nobel Prize for Physiology or Medicine. In this interview with the *Unesco Courier*, James Watson reveals his hopes and fears for the future of research, and talks of the complex and important question of bioethics. His published works include *Molecular Biology of the Gene* (1965), and *The Double Helix* (1968).

■ *The DNA discovery was one of the crucial scientific breakthroughs of the post-war years, and it also made you and your colleague Francis Crick famous worldwide....*

—DNA, the molecule, made me famous. I didn't make the molecule famous. It's the most important molecule of all in the sense that it carries our genetic instructions. The fact that the answer was so simple partly explains why we became so famous—but that was because the molecule was simple, not because we had found a simple way of interpreting it to people outside. So we became famous because DNA had such a likeable structure.

■ *What led you into biology in the first place?*

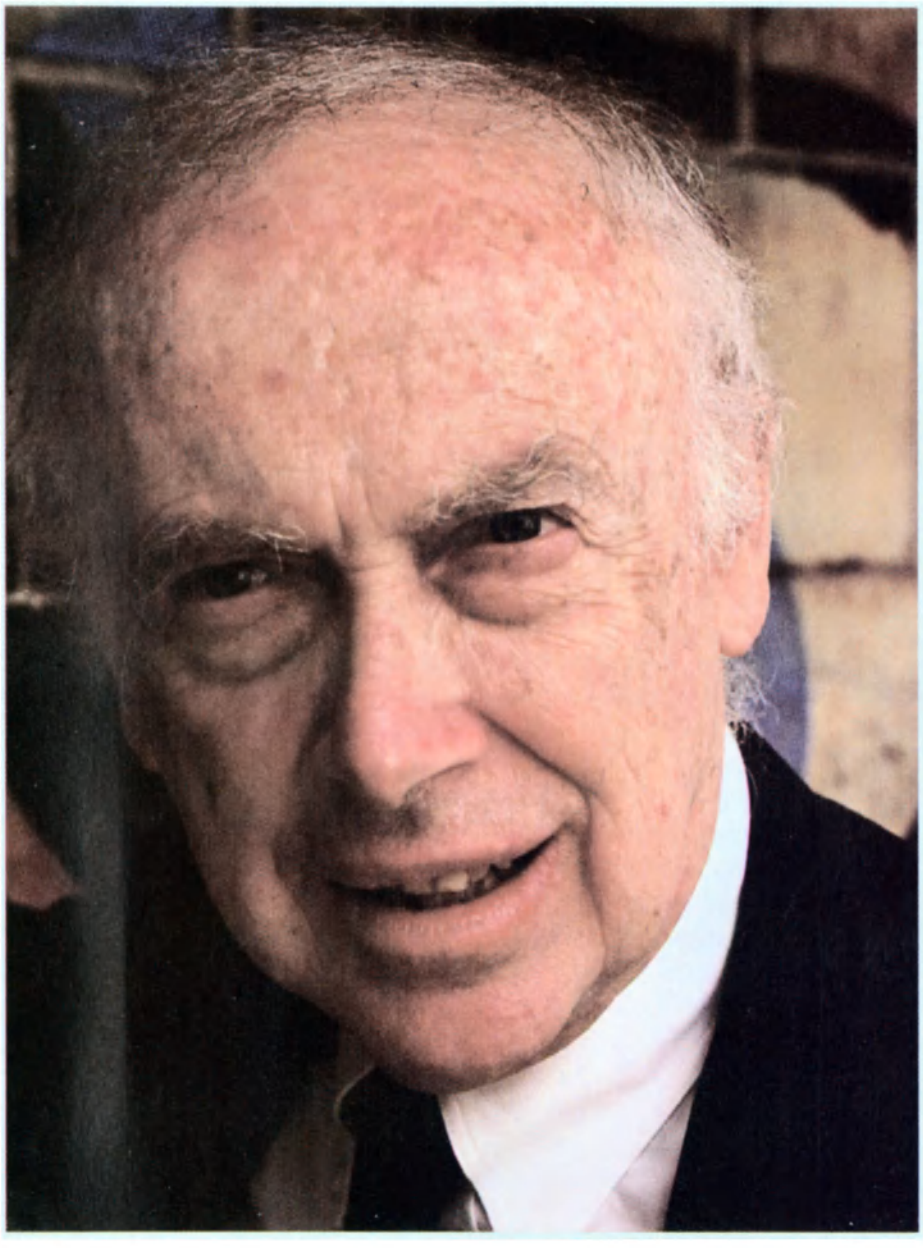
—I went into biology because I was interested in what life was. Where did we come from? Initially I was very excited by what I had learned about Charles Darwin and the theory of evolution, that we weren't created as it was stated in the Bible and there was no Ark or anything like that. Instead there were several billion years of evolution. But how did the whole thing start? What was really the basis of the continuity between one organism and another? Why do some animals grow up to be cats and some grow up to be human beings? And the answer turned out to lie in our genes. It's instructions which are carried in our genes which make us a human being or a bacterium or a monkey. And so if the real uniqueness of a living form lies in the set of instructions that is the genes, I wanted to know what the gene was.

Initially I had thought I was going to be a naturalist, with particular interest in birds—I had grown up on the south side of Chicago not too far from the steel mills, so my aim was not to live in a city but to escape into nature and to study nature. But then I got interested in what the gene was, so I didn't go outside, I stayed inside, in my little laboratory, at least to start with.

■ *What was the immediate significance of the discovery of DNA? What prospects did it open up?*

—Its significance was that, since it was the genetic molecule, it was the most important of all molecules inside cells. If you're asking what did we plan to do with it, initially we didn't know. We had to find out how it worked. Many, many thousands of people are now involved in that search. When we

SERAFÍN GARCÍA IBÁÑEZ
is a journalist with Unesco's Office of Public Information.



found the structure, there were only a few people interested in DNA. Now there are hundreds of thousands.

■ *Picasso once said, "I do not seek, I find". Is that a statement you could apply to your own career? In other words, is scientific discovery in your experience the result of careful planning, or does it have more to do with luck?*

—I think in most cases it's a product of both. You generally don't find gold unless you're looking for it. You have to have an objective. Whether you then reach it partly depends on how many other people are out there trying to prospect for gold. Luckily, when we were there, almost no-one else was prospecting. In fact there were only three groups in the world trying to find the gold that DNA turned out to be. And we found it first.

■ *I'd like to ask a question about the technical background to discovery. Research nowadays has extraordinary means at its disposal—laboratories, powerful computers, and so on. As a result, only a handful of countries—those that can afford these tools—are in a position to make scientific discoveries. Does that fact alarm you? Is there any way of balancing out the way in which the fruits of discovery are shared?*

—Depending on how expensive the research is, it's going to be limited to those people who can afford it. You cannot imagine countries in central Africa having the means to build super-colliders in the form that they exist, say, at CERN, the European Organization for Nuclear Research. It takes a great deal of wealth to do that.

On the other hand, I think it's very important that the knowledge that comes from discovery should be spread. In the old days we used to say the most important thing for UNESCO to do was to give books out to people, so they could read and find out what was up. Now of course there are other forms of media; information goes out on television and the radio and of course on computers.

A free society—the best societies—have a rapid flow of information. I think that's probably the most important thing—that even those who don't have the best teachers and are not in the best universities can still get at the facts.

I was very privileged with my education. I went to one of the best universities in the world, I had a very good teacher, so I was told what was important, and if I hadn't gone to that school, the name Watson would not be well known. Today I think it's possible to make high-quality education much more widely available through, particularly, TV and cable or satellite. There's really no reason why, in the future, people in relatively primitive environments shouldn't be exposed to the very best teaching, if people have the interest to make it so. So if I had to say the most important thing UNESCO could do now, I think it would be getting information out to people, providing them with information.

You can't make them read and you can't make them listen, but you can give them that possibility.

In my own case, my family lived close to a public library and my father used to walk to the library with me once a week when I was young. We got books out. The knowledge was available. I didn't come from a wealthy family, but there was a library. It was the library that first opened your eyes to worlds beyond your own limited one.

Most people are born without great aspirations, and they don't think they can do great things. You've got to let them see that there are still great things to be done, and they can be done by many people. It's not only privileged people who can do things. In fact, I'm surprised how often the people on top make mistakes, even though they have all the advantages. So it's opportunity that matters. I think you really have to provide the opportunity of a high-quality education. Other people might point out you have to give people health, because if they're sick they can't learn. So let's say that health *and* education are the most important things to give people in underdeveloped regions.

■ *The human genome project is seeking to decode our genetic heritage, our genetic book. Can you tell us about this great project? What stage has it reached?*

—We've just started. But we have the technical means to finish the project within the next fifteen to twenty-five years. You have to know when to say you're finished: when you've got 90 per cent of the information, or 95 per cent or 98. It's slightly arbitrary. We're never going to get 100 per cent, because there's just so much information there. But we're going to know most of it.

Finding a few new ways to reduce the costs of the project would certainly help. Even so, there's a realistic chance of finishing it for the cost of three trips of the Space Shuttle. I think if people were asked, do you want the human genome or do you want three trips from the Space Shuttle, almost everyone would say that they'd rather have the human genome. But we've got the Space Shuttle!

■ *You'd agree that the human genome is a big project in every way. It's "big science" like, in the past, nuclear power. . . .*

—But it's not big science in the way that the super-colliders are in the world of physics. The super-collider in Texas might take half the money for physics in the United States. That's a lot. But the human genome project would probably never take more than two per cent of the money for biomedical research. It doesn't have that all-or-nothing element. There are many physicists who feel, "Well, if we build this machine, I'm out of a job because I'm not part of that machine." But we're not going to put any people out of work.

Despite appearances, the project really isn't that big. It's really a sort of bubble, a bubble on the surface. But I think it's probably the most important bubble that exists in biomedical research now, because it is so important to the understanding of diseases.

■ *Do you think that some scientists conceal, even if only for a little while, some of their knowledge?*

—Oh, I think people are always going to conceal, and I don't think you should get too upset about it. If someone is prospecting for gold and thinks he sees a little bit of it, he wants to be sure before he gets a thousand people in the same stream. I think the question is how fast the information is released. You need fast publication, and you have to have a fairly honest system whereby the people who make the discoveries get the credit for them.

Having competition is good. I would hate to have only one team out there trying to find the gene that, say, predisposes many women to breast cancer. I'd rather have quite a few. Each wants to make the discovery, not only because it's important scientifically but, well, if they make the discovery maybe they can develop a diagnostic test. Then they might become not only scientifically famous but might also make some money, might be able to buy a better car. That's a regular human emotion, and I don't think we should try and change it.

I think what you need to have are rules by which those who make discoveries get rewarded. We tend to find—it's a pretty good rule—that people will exchange information quite freely except when they feel they're very close to a discovery. As long as they think the discovery is probably not going to be made tomorrow, then they'll say "This is what I think". If they think it's going to be made the next day, they're not going to tell someone a fact that would let them make it first. I think that's just a fact of life. Otherwise, it would be like playing tennis and not wanting to win.

As to the general question, do we on the whole exchange information fairly fast, the answer is "Yes". And the chief reason why is that it's much more fun to get

James Watson and Francis Crick (seated in foreground) and other Nobel prizewinners at UNESCO's Paris Headquarters, where they took part in a symposium entitled "From the double helix to the human genome: 40 years of molecular genetics" (21-23 April 1993).

someone excited about what you're doing. If you just keep everything to yourself, it's like having a very fine painting and not showing it to anyone. You get pleasure in being able to show nice things to other people. And of course, I got a lot of pleasure from being able to tell people about the double helix.

■ *What is your opinion on the patenting of discoveries in human genetics?*
—I think it's pretty much the custom that if you find something useful—say, you've discovered a gene that people didn't know about yet which would let you make an important drug—then that's going to be patented. It's happened already. It fits in with the way industry operates in the world. If you make a discovery, you're rewarded.

The controversy was not about whether you could patent something important. It was that you could patent something before you understood what it did. I strongly opposed the decision of the National Institutes of Health to patent DNA irrespective of whether the patenter understood what it did or not. I had difficulties with the director of NIH and I was asked to give up my job, because I thought that the government's policy was irresponsible, to industry as well as to everyone. It was just silly. Everyone I knew agreed with me, so it wasn't as if there was much controversy in the scientific world. In fact there was *no* controversy—we all thought it was stupid. But it was done.

■ *Is there any reason to feel afraid of the uses to which genetics could be put?*
—Yes, there certainly is. I think we have to develop laws so that genetic knowledge is confidential. I wouldn't want anyone having the right to look at my DNA. And no-one should have to show their DNA before they're employed.

There are going to be difficult situations. If you know there's a genetic disease in your family, do you have an obligation to tell someone you might marry? That problem already exists; people have kept quiet when there was "madness" in the family. You're going to have cases where ethical behaviour would compel you to reveal these things.

On the other hand, at the level of employers I think we're going to have to have laws. Just like with medical records. I don't think someone's medical record should be in the public domain. It gets very difficult now that we're asking politicians to show their medical records. I think that's a bad idea, and similarly I don't think you should demand that political candidates have a genetic examination. And I think it would be pretty dangerous if you were expected to have a genetic examination when you were married. I think we're going to learn from experience, but my own personal prejudice is that we should only reveal when it's absolutely necessary.

■ *What ethical code, what precautions or laws could ensure that knowledge of the human genome is used in a human way?*
—I don't think laws *per se* can do this. I think you've also got to look to cultural traditions. I mean, is it a failure of law that is responsible for what's happening in Bosnia now? It's what children learn in their families, what they learn in their schools, what examples they get from their political leaders, that count.

All knowledge in some form or other can have bad consequences. Personally I'm against too many laws, because I think they can be used to restrict activities. On the other hand, I think it's pretty clear that people are going to be very afraid of this genetic information, and will possibly try and stop the information being gathered unless they feel they're protected against real misuse of this knowledge.

When I became director at the National Institutes of Health, I made an arbitrary decision that we'd spend three per cent of the available money on ethics. By the time I left we were spending five per cent. I think if I was still there the figure would be going up, because this really is a very complicated issue.

■ *Are there any other passions in your life besides biology?*
—As I run an institution, I like to build architecturally distinguished buildings. I have a touch of megalomania. I like to make the world more beautiful. ■

EDITORIAL

AFTER being for so long a utopian dream, has disarmament now become a practical proposition?

We remember how, some fifteen years ago, UNESCO invited Nobel Peace Prize winner Lord Noel-Baker to a symposium at which one of his fellow-participants was another Nobel Peace laureate, Sean MacBride. By then over eighty, his eyesight failing, Lord Noel-Baker spoke without notes. His voice was clear, his turns of phrase elegant, his reasoning firm, consistent and irrefutable. He took his listeners back to the time of David Lloyd George, whom he had known well and to whom, in the aftermath of the First World War, he had already pressed the case for transferring the massive resources invested in arms research and production to education, health and other forms of welfare. Of course, such reasoning became even more relevant and urgent after the Second World War, when East and West spent colossal amounts of money to keep up with each other in the arms race.

What was so moving about Lord Noel-Baker's speech that we still remember it vividly many years later? Perhaps it was the contrast between the physical signs of the orator's age and the subtlety, eloquence and undimmed intellectual fire with which he spoke. Perhaps too it was the gap, which suddenly seemed intolerable, between the dream of a world without weapons and the absurd reality of an accelerating, seemingly unending arms race.

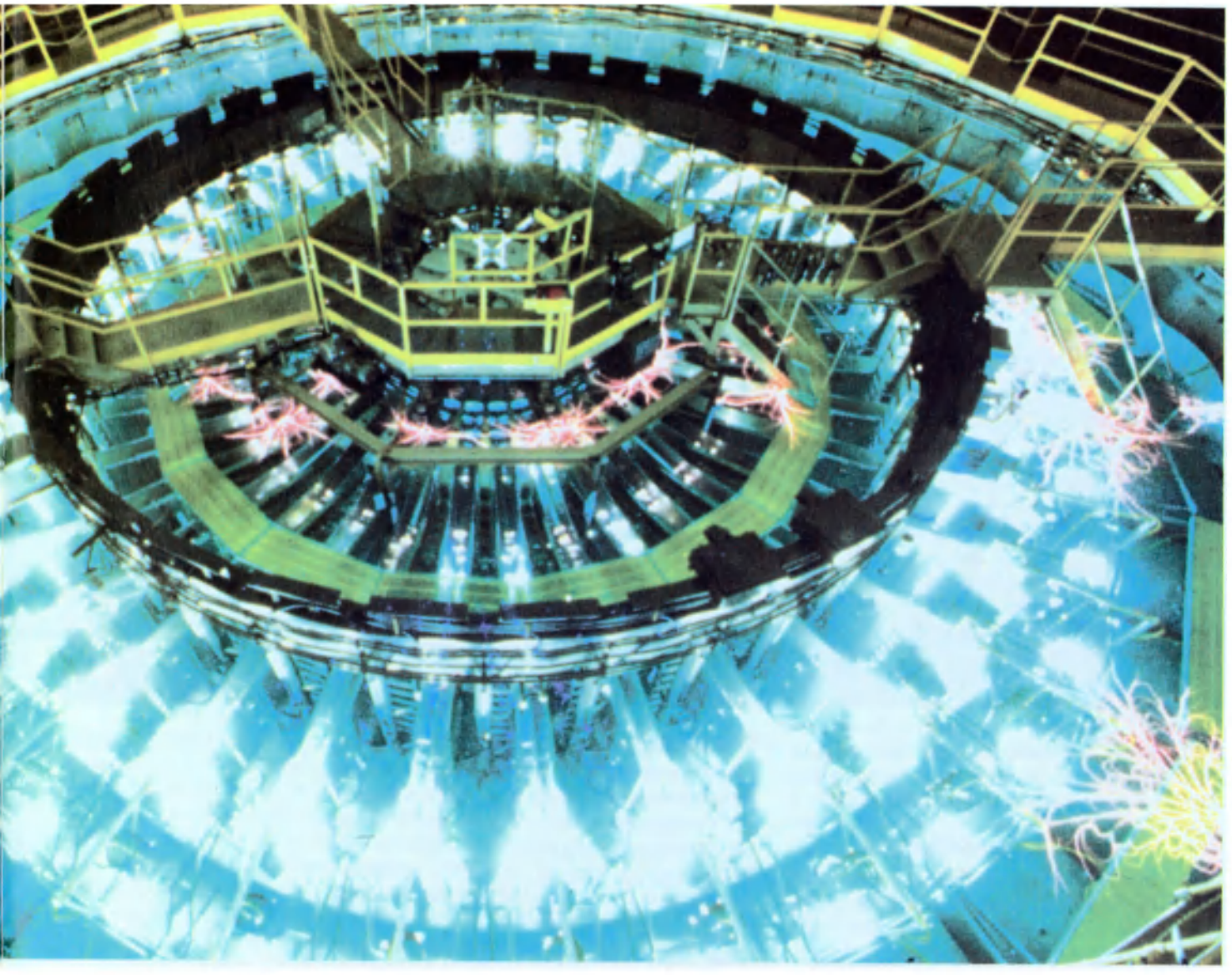
Today the bipolar world is a thing of the past, and the balance of terror can no longer serve as a pretext for a gadarene rush to the brink of the abyss. Does this mean that humanity will start to prefer negotiation to war? Can we expect to see nations making or buying fewer bombers and building more schools and hospitals?

In exploring some aspects of this question, the present issue of the *UNESCO Courier* reveals at the outset its complexity and its paradoxes. While many moral, political and socio-economic arguments now plead in favour of a "disarmament race", the context of the post-Cold War period is also bringing to light contradictions, constraints and habits that will not vanish overnight just because America and Russia are no longer clashing on the ideological battlefield.

New ideas about disarmament are starting to take shape, but at the same time new trends toward rearmament are emerging. From the following pages it can be seen that this contradictory two-way movement reflects a much older conflict between a mentality based on distrust, fear and the cult of strength rather than the culture of law and a revolutionary state of mind that looks forward to the challenge of a peaceful future in which freedom and justice will be possible for all. ■

BAHGAT ELNADI AND ADEL RIFAAT

Fifty trillion watts of electricity were produced by the Saturn machine (above) during tests to simulate space attacks by radiation-producing weapons at a Strategic Defense Initiative ("Star Wars") test site at Sandia (United States).



Making disarmament work

by Dominique David

What can be done to reduce swollen arms budgets?

THE arguments in favour of disarmament have always been based on three main assumptions: that a) it is immoral to accumulate stocks of weapons; b) this build-up is a threat to peace, and c) the economic cost is reflected in artificial or misdirected development.

The moral argument has always been put forward strongly against chemical weapons and, after Hiroshima and Nagasaki, also against nuclear weapons. The industrial production of arms has permitted long-drawn-out wars and enabled unprecedented violence to be unleashed. The cost of modern weaponry is hard to sustain and has literally devastated the economies of some countries.

However, these simple facts have not sufficed to win full acceptance for the concept of general disarmament. That idea was widely endorsed in the 1950s. It gave way in the 1960s to the more realistic, but at the same time more limited, notion of arms control. The major nuclear powers negotiated to reach agreement on certain rules of coexistence and on the development of their respective arsenals. The aim was no longer to disarm or even to freeze the growth of arms stockpiles, but to impose a framework on that growth in areas where the powers were willing to engage in discussions with each other. At no time did the American and Soviet stockpiles of nuclear weapons grow more rapidly than during the Strategic Arms Limitation Talks (SALT) in the 1970s.

The changes which took place in the late 1980s, especially in the former USSR., enabled real agreements on the withdrawal and destruction of

What justification can there be for the image of rich countries which believe nuclear weapons are good for themselves but unacceptable for others?

weapons to be negotiated and concluded. However, the optimism soon faded. The 1987 US-Soviet Treaty on the Elimination of Intermediate-Range and Shorter-Range Missiles, the 1990 Treaty on Conventional Armed Forces in Europe (CFE) and the 1991 START 1 Treaty[1] on strategic missiles only concerned limited quantities of weaponry. Moreover, the application of these treaties is fraught with uncertainty following the break-up of the Eastern bloc. Last but not least, the vast area of the South is not covered by any global or regional disarmament process.

POLITICAL OBSTACLES

Hopes of disarmament are thwarted by countless difficulties and objections, particularly of a political nature. The creation of armed forces and industries to guarantee self-sufficiency in the procurement of military hardware and the adaptation of these resources to technical progress, are privileges of national independence. The period of decolonization which began at the end of the Second World War naturally led to considerable growth in conventional arsenals belonging to the new sovereign states. Agreements encompassing the Third World might be viewed by some of these countries as intolerable limitations on their sovereignty. How can these countries be prevented from thinking that the Western nations only discover the dangers of weaponry when they have no prospect of effecting new sales? What justification can there be for the image of rich countries which believe nuclear weapons are good for themselves, but unacceptable for others?

Moreover, translating the concept of disarmament into law is a very complicated business. Treaties leading to a general ban on weapons are very difficult to draw up and even more difficult to implement and enforce. Regional agreements are more effective but presuppose the settlement of existing conflicts and the opening of a sincere political dialogue between the countries of a particular region.

In Europe, one of the main obstacles to the disarmament process at present resides in the disappearance of the states that were to negotiate and apply these accords. The break-up of the Warsaw Treaty Organization (WTO), the fragmentation of the former USSR and the weakening of certain countries, illustrate the scale of the problems to be solved. What is more, no one can predict what the situation will be in a few years' time. To date, only one of the agreements negotiated in recent years has been put into effect. Despite the rapidity of political change in Europe, the arms stockpiles there today are not much different from those of a decade or so ago.

SOCIO-ECONOMIC HURDLES

In the past fifteen years, some Third World countries have made a breakthrough into the arms trade. Arms exports have now become an important sector of their economy. The proliferation of local conflicts has broadened some markets, in particular the market for light weapons requiring medium level technology. The new exporting countries are well placed to supply these markets. The saturation of some traditional markets of the Western countries therefore does not imply that a global reduction has already taken place in worldwide arms production and in the arms trade—or even that such a reduction is now under way.

In Europe, countries like Russia and the former Czechoslovakia soon realized that economic and social considerations simply made it impossible for them to close down their arms production facilities—in Russia, this is the only sector of the economy that seems able to remain self-financing in convertible currency—hence the sale of arms by some countries of the former Warsaw Treaty on the markets of the South at knockdown prices. This is the key problem because it involves the radical conversion of an economy structured around military production. This trend seems impossible to reverse in the short term.

DOMINIQUE DAVID, of France, holds a post of special responsibility under the director of France's Institute of International Relations (IFRI), and is a professor at the Saint-Cyr Special Military School. He is the author of *Conflits, puissances et stratégies en Europe* (Conflicts, Powers and Strategies in Europe), Brussels, 1992.

In the countries of the North, the arms industry is often a guarantee of their presence in the race to develop high technology. The Strategic Defense Initiative (the famous "Star Wars") launched by the Reagan administration in 1983 was a striking example of this phenomenon. The will to disarm, indissociable from a reduction of exports, is therefore obstructed by the need to safeguard systems of high value research which cannot readily be transferred or converted to other sectors. Some observers even fear that stockpiling in quantitative terms may be replaced by technological sophistication, which would of course be a way of circumventing the very concept of disarmament.

RISKS AND OPPORTUNITIES

Although progress towards a world with smaller arms stockpiles is politically, economically and technically hard to achieve, there can be no doubt that it is a strategic imperative. First of all, no theoretical definition of an optimum quantity of arms can be adduced. Neither the "militarist" theory—"the more weapons there are, the safer things are", nor the "pacifist" theory, "the less weapons there are, the safer things are"—holds water. Specific cases must be examined. But the world situation today gives cause for permanent anxiety.

In the North, the stocks of American and ex-Soviet nuclear arms no longer reflect any logic of strategic conflict. Although these weapons were strictly controlled by the political powers of yesterday and are still under relatively firm control today, we can have no certainty about the future. The hypothesis of a rapid deterioration of the situation also applies to conventional weapons. The European arsenals are over-endowed: are they now destined to be spread still more widely, to follow the fragmentation of communities and so nourish interminable conflicts? After escaping from the gravitational pull which used to be exerted on them by the East-West conflictual system that has ceased to exist, these weapons may well now be used in local conflicts or escape beyond the frontiers of Europe to regions which are already overarmed.

In the South, the concept of proliferation is often perceived as an idea of the North: in other words, arms proliferation is seen as beginning where its control by the rich countries ends. Be that as it may, the quantities of weaponry and the factors which make for destabilization are increasing in many places throughout the world. In the aftermath of the Gulf War, technologies whose effectiveness was demonstrated in this theatre have been marketed widely. The great post-Soviet sell-off has resulted in the rapid transfer of vast amounts of weaponry. What is more, these traditional suppliers have been joined by many Third World manufacturers. Supply is thus increasing, but so too is demand. Some latent conflicts which had hitherto been held in check by the Moscow-Washington relationship are now able to break out freely.

Even if it does not at present reflect the true situation, the image of a North united in upholding its wealth and military might (an image to which the Gulf War lent credibility) could encourage some countries of the South to acquire weapons in the face of what they perceive as at best a system of exclusion and at worst a threat. Unfortunately, this conjunction of factors seems to point at one and the same time to a proliferation of conflicts and to an increase in their level of technological sophistication.

Details from *War* (1955, opposite page) and *Peace* (1956, above), two murals by the Brazilian artist Candido Portinari. They adorn the delegates' lobby of the General Assembly building at United Nations Headquarters in New York.

REGIONAL NEGOTIATIONS AND AGREEMENTS

Disarmament is less than ever a spontaneous process. In addition to the traditional economic arguments—after all, capital gains from arms exports can never be anything other than temporary—and the moral and political arguments, there are now pressing strategic and security considerations. The time has come for a global reduction of stocks and the regulation of weapons transfers.

But a combination of many factors is needed to bring about the success of bilateral or multilateral negotiations and the implementation of the resulting treaties. The most important of these factors, such as adequate political cohesion, do not always exist today to a sufficient degree for pronouncements to be made about the future with any certainty. Moreover, disarmament is not a meaningful concept in isolation: it is the reflection and the product of a thaw in relations and of political trust. Conversely, arms stockpiling is the expression of tension and closed attitudes. Such attitudes are particularly redoubtable today.

The changes that have taken place in the past five years are both an opportunity and a threat. Are political leaders sufficiently aware of these risks to place the need for disarmament in the forefront of their preoccupations? If they are not, loose cannon may soon pose a serious threat to our future. ■

1. Strategic Arms Reduction Talks (see glossary on page 39)

Wanted: a new philosophy

by Jean Klein

Despite all the progress that has been made, the principle of deterrence still carries too much weight in current disarmament negotiations

SINCE the end of the Second World War, the question of disarmament has been permanently on the agenda of the United Nations General Assembly, and the major military powers have engaged in endless debate about it. Nevertheless, all the efforts of the international community towards this goal have produced only modest results, and it is only in the course of the last decade that the member states of the two alliances that constituted the American and the Soviet camps have embarked on the path of authentic disarmament. This trend has been confirmed since the collapse of the communist regimes in the countries of central and eastern Europe and the dissolution of the Warsaw Treaty Organization (WTO) or Warsaw Pact, while the Gulf War underlined the risks of an uncontrolled spread of conventional and nuclear weapons in various zones of conflict.

Speculation is thus rife as to the chances of, and the suitable pace for, a disarmament process that would at last make it possible to overcome the divisions inherited from the past and reinforce international security while "diverting to armaments only the minimum of the world's economic and human resources". For some, the "disarmament race" is irreversible, and nuclear weapons are doomed to wither away once security can be guaranteed at less risk within the framework of a collective organization. Others are more sceptical and believe that cutbacks in military expenditure and the reduction of armed forces and weaponry stem not so much from a new political vision as from structural adjustments determined by economic and social factors in the wealthy societies. The fact is that, apart from the Washington Treaty of 1987, the other disarmament agreements (CFE, START) are not yet in force, and their implementation raises all kinds of difficulties. So it is well to be prudent in assessing the chances for disarmament in the new international context.

AN IMMEDIATE ACTION PROGRAMME

Today, the threat that the armies of the Warsaw Pact represented for the West has vanished, tactical nuclear weapons have almost entirely disappeared from the European continent, and the new strategic concept of the North Atlantic Treaty Organization (NATO) gives pride of place to arms control and disarmament within the framework of "co-operative security". It is therefore essential that the 1990 Treaty on Conventional Forces in Europe (CFE) should come into effect as rapidly as possible. The arrangement concluded in Tashkent in May 1992 on the sharing of arms quotas between eight countries of the former USSR that are directly concerned augurs well for their willingness to make it work. Building on what has been achieved, the participating states of the Conference on Security and Co-operation in Europe (CSCE) will next try to reinforce stability in Europe and in certain "frontier zones". The drive for stability will entail the adoption of new measures intended both to ensure greater transparency in military activities and to reduce the level of armed forces to a minimum corresponding to legitimate security needs or maintain them at that level. A programme of

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immediate action was approved at the end of the Helsinki summit conference in Finland, on 10 July 1992.

Meanwhile, the momentum triggered by the START (Strategic Arms Reduction Talks) Treaty has been kept up and even accelerated. After the withdrawal and even the destruction of a sizeable number of tactical nuclear weapons, land-based and deployed on surface ships or in submarines, both Russians and Americans have put a stop to the production of fissionable materials for military purposes. In June 1992 they also agreed in principle to drastically reduce their strategic weapons and to eliminate ground-to-ground missiles with multiple warheads by the year 2003. It should be noted that the control of nuclear weapons is still the exclusive preserve of these two protagonists and that they are pressing forward rapidly to attain their goals with the least delay. They have, for instance, harmonized unilateral declarations on both sides relating to the withdrawal and destruction of tactical nuclear weapons, and the additional protocol to the START Treaty of June 1992 was negotiated in less than six months.

All the same, political friction still raises some doubts as regards the actual process of disarmament. It has to be admitted that the dismantling of tactical nuclear weapons and the storage of the resultant fissionable material from them pose delicate technical problems which can only be resolved with the help of the Western powers. The same is true of the implementation of the START agreement: in the best-case hypothesis, it will take more than ten years before the level of armaments reaches the agreed final total of 3,000/3,500 nuclear warheads. In any case, it would be misleading to present these moves as the result of a deliberate policy aimed at ending the old dilemmas of deterrence and promoting a world free from nuclear weapons. When the process ends, Russians and Americans will still possess an imposing strategic arsenal, and it is probable that the logic of deterrence based on retaining "sufficient" if not minimal capability will continue to govern their mutual relations.

MEASURES FOR NON-PROLIFERATION

Disarmament implies global action, and it is essential to reinforce the effectiveness of the United Nations in this field. This was the conclusion

In Arkansas (United States) workers dislodge equipment in an underground cableway while dismantling a Titan II intercontinental ballistic missile and deactivating its silo.

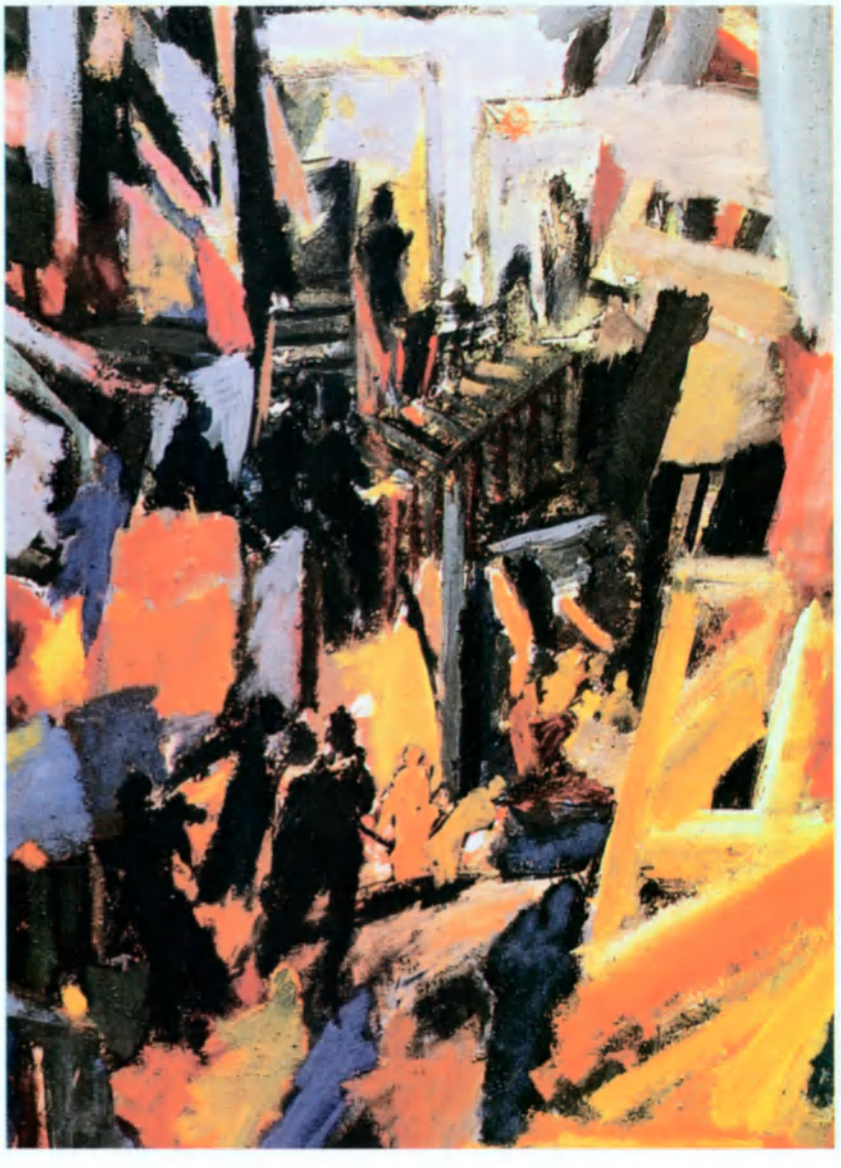
Apart from the Washington Treaty of 1987, the other disarmament agreements are not yet in force.

reached by members of the Security Council at a meeting held on 31 January 1992 at the Heads of State or Government level to examine current aspects of "the maintenance of international peace and security". On that occasion, stress was placed on the need to prevent the proliferation of weapons of mass destruction, to regulate the transfer of conventional arms and to control by peaceful means "any problems concerning these matters threatening or disrupting the maintenance of regional and global stability."

Measures have already been taken to consolidate and extend beyond 1995 the system set up by the Treaty on the Non-Poliferation of Nuclear Weapons (NPT), and there are plans to make more resources available to the International Atomic Energy Agency (IAEA) and enlarge its fields of competence so that it can fulfil its monitoring role. Moreover, the export of sensitive technology is being subjected to ever stricter surveillance, and an International Centre of Science and Technology has been created, with the support of the West, aimed at dissuading scientists and engineers working in the arms industry of the former USSR from lending their skills to "proliferating" states.

In the field of conventional weapons, the five permanent members of the Security Council have defined a code of conduct, but this seems to have been scarcely respected, to judge by the transfers of arms that have taken place in certain sensitive areas. On the other hand, multilateral negotiations aimed at banning the production and stockpiling of chemical weapons and ultimately eliminating them altogether have entered a decisive phase, and it is hoped that an agreement will be concluded shortly.

Untitled acrylic painting on canvas by the Lebanese artist Samir Khaddaje.



A WORLD PERSPECTIVE

While the end of the Cold War and the new relationship that has emerged between the former adversaries have called into question the traditional approach to arms control, it is still regarded as one of the best means of reducing international tension, preventing conflicts and facilitating the peaceful settlement of differences.

Neither the Americans nor the Russians have any intention of thus repudiating the gains made during several decades of concerted action to avert the perils of the nuclear age; on the contrary, they are determined to keep on their present course and even to aim for more ambitious objectives than those they have already set themselves.

It remains to be seen whether the nuclear disarmament on which they have agreed can be satisfactorily implemented, given the current situation in the states that resulted from the dismemberment of the USSR and considering the difficulties already encountered by those bodies responsible for verifying precisely whether the commitments entered into are being respected.

In Europe, the reduction of conventional forces has been viewed from the start as an essentially political process. The aim was not so much to perpetuate the *status quo* by adjusting the military balance between NATO and the WTO as to encourage the emergence of a new security system based on dialogue, co-operation and the maintenance of a purely defensive capability. The situation thus gradually changed from antagonism to peaceful coexistence before shifting to co-operation within the framework of the CSCE, and now the way has been paved for true disarmament by the adoption of confidence-building measures.

A Kuwait oil well set ablaze during the 1991 Gulf War.

Whilst this model cannot be replicated elsewhere as it stands, it should serve as an inspiration for putting a stop to the conventional arms race in unstable regions of the planet. Since the end of the Gulf War, various proposals on comparable lines have been put forward for bringing about peace in the Middle East. However, the success of such an enterprise presupposes that attempts to achieve a balance of forces at the lowest level in a regional framework will respect the right of every state to security and will not be dictated by outside powers.

Moreover, arms control has to be seen in a world perspective, and it is vital to reaffirm the specific role that the UN Security Council must play in this respect. It may also be necessary to try to work out a global disarmament programme closely linked with a plan for collective security. The tenth special session of the UN General Assembly made recommendations to this effect, but they have not yielded results so far. Today, such an exercise would help clarify just what is at stake in disarmament, and would serve as a permanent reminder to member states of the supreme importance of the enterprise in which they are engaged. ■

The transformation of the European landscape calls for completely new thinking about disarmament

Europe after the Cold War

by Andrei Zagorski

DISARMAMENT issues remain high on the European agenda despite and to some extent because of the end of the Cold War. Today decisions on reductions in both nuclear and conventional arsenals are being taken at a speed that could hardly have been imagined two or three years ago.

The signing by the United States and the USSR of the INF (Intermediate-range nuclear forces) Treaty in 1987 paved the way for a new generation of agreements concerning weapons in Europe. The Treaty provided, for the first time in post-war history, not for a limitation but for an actual reduction in medium- and short-range weapons that were already deployed. Since then, efforts have ceased to be directed towards *arms control*, which in practice underwrote a controlled arms race, but towards real *disarmament*—cuts in existing weapons arsenals. This new approach has been consolidated and strengthened by the dramatic developments that have taken place in Europe since 1989, which have led in their turn to a series of agreements concerning both nuclear and conventional weapons.

The START (Strategic Arms Reduction Treaty) agreement of 1991, partially modified in terms of its implementation in the Lisbon protocol of May 1992 signed by Russia, the United States, Belarus, Ukraine and Kazakhstan, provides for cuts of around 50 per cent in strategic nuclear weapons belonging to the United States and the former USSR. When they met in June 1992 President Boris Yeltsin and President George Bush went even further along this path when they made a commitment to the complete elimination of ground-based heavy missiles as well as deep cuts in US sea-launched strategic missiles.

The Treaty on Conventional Forces in Europe (CFE1), signed on 19 November 1990, sought to eliminate numerical imbalances in five categories of weapons (battle tanks, armoured combat vehicles, artillery, combat aircraft and attack helicopters) available to the North Atlantic Treaty Organization (NATO) and the Warsaw Treaty Organization (WTO) in the area stretching from the Atlantic to the Urals, as well as to reduce their numbers and limit their ability to carry out a surprise attack. A follow-up to this Treaty, the CFE1 A agreement, established limits for personnel strength in the same area. CFE1 A, which is not a treaty but a politically binding document, was signed by twenty-five states on 9 July 1992.

No less important than these multilateral agreements are deeper cuts resulting from unilateral reductions on both of the previously adversary sides—East and West. They include cuts in

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Left, withdrawal of Soviet forces stationed in Hungary (1989). Above, American troops evacuate the military base at Bremerhaven (Germany) in 1990.

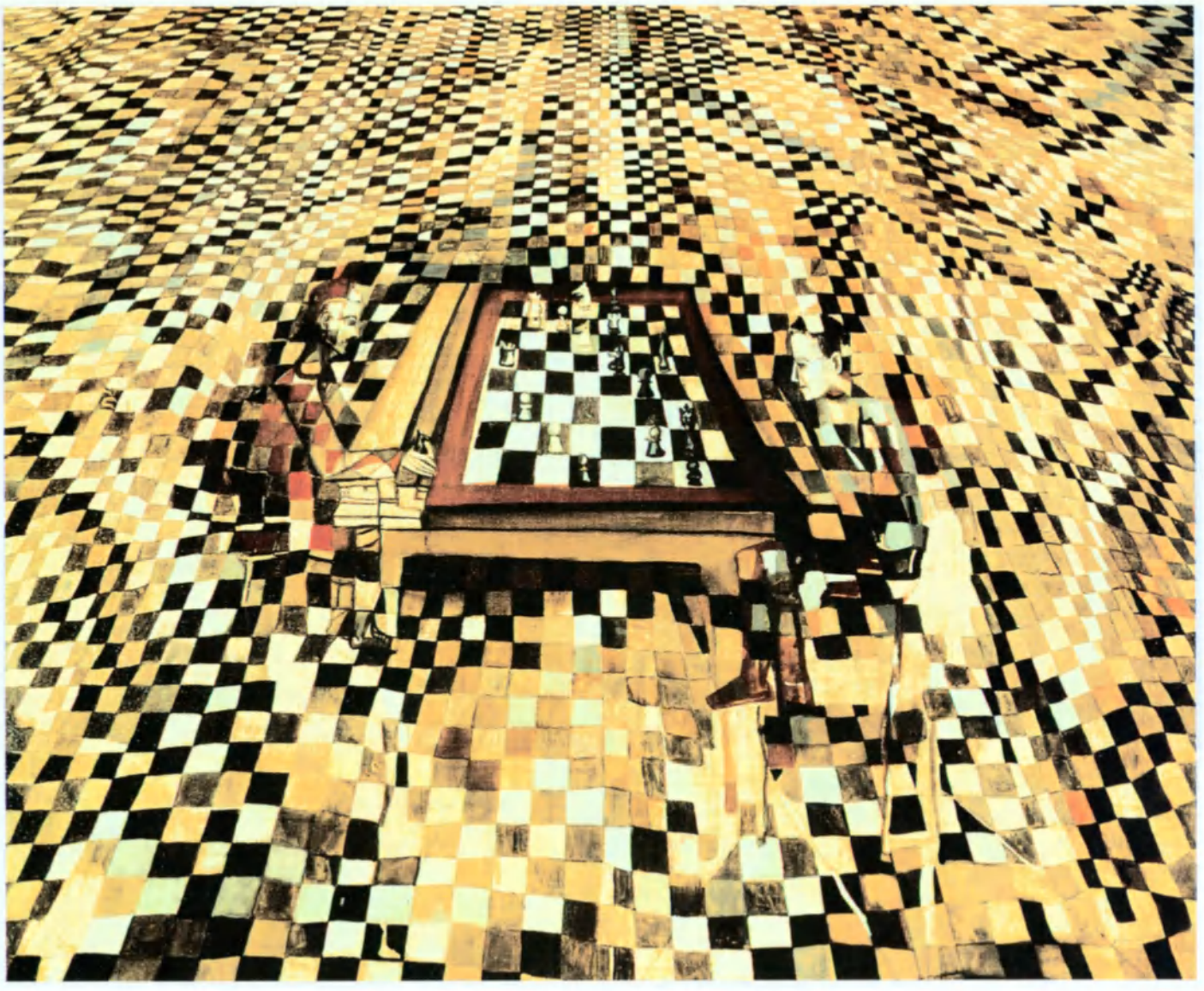
tactical nuclear weapons in Europe providing for a total withdrawal of US and former Soviet ground-launched battlefield weapons (short-range missiles and nuclear artillery). Unilateral cuts are also being made in the nuclear forces of both France and the United Kingdom, although neither country has yet participated in formal negotiations on these issues.

However, the spectacular developments that have taken place in the field of European disarmament since the end of the Cold War have been accompanied by a wide range of new challenges which make the task of managing this process quite difficult. One indication of the difficulties facing the European disarmament process today is the fact that hardly any of the recent disarmament agreements, including the CFE1 Treaty, have yet entered into force, because several states have not yet ratified them. Another problem is that the conceptual approach to European disarmament is still largely based on attitudes that were shaped during the years of East-West confrontation and have not been adapted to current needs. The disintegration of the Warsaw Treaty Organization and the break-up of the Soviet Union have totally changed not only the environment of disarmament negotiations and the positions of the parties to them, but the very functions of the negotiations.

The disappearance of the Warsaw Treaty Organization, which happened *de jure* in 1991 but *de facto* in 1990, made the Treaty on Conventional Forces in Europe virtually obsolete, since it had emerged from negotiations that began as a bloc-to-bloc endeavour aimed at improving the level of stability and predictability between NATO and WTO. This general approach was to a great extent outdated before the negotiations were concluded. Early in 1990, Hungary announced that its defence needs could not be properly dealt with in a bloc-to-bloc arrangement and insisted that its quota of armaments should not be established within the framework of the WTO. Other East European countries followed suit and by the time the CFE1 talks came to an end the major problem was no longer the achievement of an agreement between East and West but the achievement of mutually acceptable quotas *within* the WTO, which still formally existed. In order to provide East European countries with appropriate quotas for their national forces, the limits on armaments within the CFE1 Treaty were raised even higher than those initially envisaged.

The break-up of the Soviet Union meant that new tasks had to be carried out within the CFE framework, especially after the division of former Soviet military assets became one of the most controversial issues among the members of the Commonwealth of Independent States (CIS), which was joined by eleven of the fifteen former Soviet republics. The CFE1 Treaty thus became a framework for discussions on the sharing of Soviet military assets and for legitimizing Western participation in these discussions. The successors of the Soviet Union committed themselves to respect obligations under the CFE1 Treaty and were urged to negotiate rapidly and to reach agreement before June 1992.

On 15 May 1992, at a CIS summit meeting in Tashkent, an agreement on the implementation of the CFE1 Treaty was reached, including provisions for a share-out of the former Soviet quotas on various categories of weapons. This agreement



All disarmament efforts in Europe so far have been based on the philosophy of managing problems at the level of East-West relations.

was then approved at a conference of the parties to the CFE1 Treaty held in Oslo on 5 June and by an extraordinary conference held on 10 July in Helsinki in conjunction with the CSCE summit meeting.

However, the issue cannot be regarded as settled since none of the CIS states except Russia had ratified the CFE1 Treaty before the CSCE summit as had been agreed previously. Prospects for ratification can be regarded as high only in the case of Belarus and are low in the case of the Caucasian states that are engaged in military hostilities. That is why, instead of enacting the CFE1 Treaty, as was initially planned, the extraordinary conference of July 1992 only produced a document on the "provisional application" of the Treaty whereby all parties committed themselves to "apply provisionally all of the provisions of the Treaty, beginning on 17 July 1992" within 120 days, in the expectation that the Treaty would be ratified within that time-frame. Armenia, Azerbaijan, Georgia and Moldova have not yet signed this document.

Disintegration problems at least partially similar to those within the former Soviet Union might be expected to arise elsewhere, especially in view of the division of Czechoslovakia into the Czech Republic and Slovakia early in 1993.

All previous disarmament efforts in Europe so far have been based on the philosophy of managing problems at the macro-level of East-West relations. In formal terms this approach came to an end in September 1992, when all fifty-two of the CSCE countries sat down to begin new security negotiations in Vienna. Though this new security forum is an important instrument for permanent communication and discussions of security issues, it has been launched without any clear conception of where future efforts in this field should be directed. It now has to work towards agreements that will respond to the growing number and diversity of problems at the "micro" level. ■

An appeal for non-violence

In one part of the world the school year is beginning. In others it is already underway. But sadly, for millions of children the school year does not exist. It is this that I have in mind when I call upon all those who are responsible, in one way or another, for shaping young minds.

The role of educators, which has always been important for society and its development, is today fundamental. The future evolution of the human community depends to a great extent on them and their work with the young all over the world. Will the human community sink deeper into violence, which is the expression of racism, xenophobia, intolerance, fanaticism and hate, and which in turn engenders more violence? Or will it realize the danger of turning these tendencies into everyday facts of life and react by taking advantage of every opportunity for building a culture of peace, including the important opportunity offered by children?

Children, young people in general, are the first victims of violence. Victims in the literal sense because their bodies and hearts are hurt by the consequences of blind conflicts; victims in the figurative sense because their only entertainment is to be found in the violence universally presented on screens of all kinds.

Many young people are vaguely aware of the destructive consequences of aggressive behaviour. Many admire, if we know how to present them, the great world figures of non-violence and peace—Gandhi and Martin Luther King, to name but two. Many (all in my opinion) are naturally inclined to be generous and open, and to share with others who are suffering or who are different if we explain to them that suffering or that difference.

It would be irresponsible not to seize upon this awareness of danger, this capacity to identify with heroes, this natural generosity. It would be irresponsible not to move quickly, for events are providing us each week with a host of bad examples. Yes to difference, yes to firmness and perseverance. No to violence. Yes to the force of reason. No to the reason of force.

That is why I invite all those in charge of educating and taking care of children—parents, teachers, youth leaders, those who design leisure activities for young people, organizers of youth movements and activities—to emphasize in their work the values of dialogue, sharing, respect for others and solidarity in order to build in the minds of tomorrow's citizens the solid foundations of a culture of peace. ■

FEDERICO MAYOR
Director-General of UNESCO
Paris, 8 September 1993

Left, *The chess game* (1943), oil on canvas by Maria Elena Vieira da Silva. Below, a meeting of the Conference on Security and Co-operation in Europe (CSCE) in 1991.

Investing in peace

by Jacques Fontanel

Profitable yet non-productive, the arms industry is still a key sector in the world economy. Will it be possible to convert to development the resources freed by disarmament?

THE United Nations has sought to promote disarmament ever since its foundation and has demonstrated that there is a close link between disarmament and economic and social development. A comprehensive UN report on this relationship, issued in 1982, found that more publicity should be given to military spending, that it would be useful to convert some of the resources freed by disarmament to meet economic and social needs in developing countries, and that consideration should be given to establishing an "international disarmament fund for development." However, the report was not unanimously accepted, and a special session of the UN General Assembly in June 1982 merely confirmed the absence of any real hope of progress. In fact, the subject dropped out of the picture during the 1980s.

The political and economic upheavals that have taken place in Eastern Europe, the disarmament agreements that have been reached (which, though limited in scope, are quite specific in respect of intermediate-range missiles) and the world economic crisis have, however, all helped to bring the idea of disarmament for development back into the limelight. On the other hand, the first flush of optimism about the expected results of disarmament has now faded somewhat. Three questions arise:

- Does armament put a brake on development?
- Are the effects of disarmament on national economies entirely beneficial?
- Can disarmament easily be combined with

transfers of resources from the developed countries to the developing ones?

A BRAKE ON DEVELOPMENT?

Economists regard military expenditure as non-productive spending, yet it amounts to nearly $1,000 billion (or 5 per cent of the world's gross national product), more than 50 million people are employed in military activities, and research and development in the arms industry employ the skills of more than 20 per cent of the planet's scientists and engineers.

The influence of military spending on economic growth has been the subject of many studies, in some cases contradictory. Three principal ideas emerge from such studies:

☛ Military spending has a powerful effect on the shape of modern economies. According to Marxist economists, market economies need the growth of military expenditure in order to combat the tendency of profit margins to decline. J.K. Galbraith believes that the military budget neutralizes part of the surplus of products that results from an ever greater excess of supply

Left, *Let us beat swords into ploughshares* (1959), a bronze sculpture by Evgeniy Vuchetich at UN Headquarters in New York. Right, a Soviet tank bought by a British firm for recycling into girders and agricultural tools. It is one of thousands that have been scrapped as a result of arms reduction agreements.

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In the short run a slowdown in the arms race often has unfavourable economic effects, but in the long run disarmament encourages development.

over demand—demand that is reduced by the limitation of purchasing power. Free-market economists challenge this idea and consider that the market economy ought eventually to result in both disarmament and development.

☛ Military expenditure has a negative effect on economic growth. According to Seymour Melman, the militarization of the economy undermines the strength of market economies by encouraging inflationary tensions and reducing the role of efficient units of production. According to Michael Ward, while military spending may have positive short-term effects on growth in some countries such as India, the United States or Brazil, these effects are less important than those produced by other forms of public expenditure. It is undeniable that, compared with other public spending, military expenditure does least to create jobs and to stimulate economic activity.

☛ Military spending slows down investment, so that long-term economic development is threatened as well as short-term growth. A study by Emile Benoit in 1978 suggesting that such spending encourages economic and social progress in developing countries has been strongly criticized for both its form and its content.

The fact remains that such general analyses are only valid on a world scale. In some countries, arms production can have beneficial effects on the economy: arms industries create jobs while reducing imports, exports improve the balance of trade, and military technology has a positive spin-off in the civilian sector of production. Moreover, military strength protects states against the ambitions of their neighbours and provides the means for political domination—the same means deployed by the great powers in trade and monetary negotiations—to

the detriment of countries that are less well protected.

THE ECONOMIC EFFECTS OF DISARMAMENT

Disarmament is usually presented as being conducive to economic and social development. The cost of an aircraft carrier is, for instance, often compared with the number of schools and hospitals that could be built instead. A surplus of armaments invariably provokes crisis situations.

Negotiated disarmament has nevertheless to take into account the economic and stategic imperatives of international security. There are several forms of disarmament, ranging from cutbacks in military spending to the destruction of arms stockpiles or the scrapping of specific weapons, and they naturally have different economic consequences.

In general it may be said that while in the short run a slowdown in the arms race often has unfavourable economic effects, in the long run disarmament encourages development.

Three practical observations show that "peace dividends" are meagre in the short term:

☛ Disarmament does not necessarily in all cases bring about an immediate reduction in military spending. The destruction of arms stockpiles and the verification of accords involve additional costs.

☛ The destruction of arms stockpiles guarantees neither the limitation of strategic capabilities nor the reduction of military expenditure. It generally leads countries to devise new weapons that are much more sophisticated and costly than those dealt with under the accords.

☛ A cutback in military expenditure does not necessarily result in an immediate improvement in a country's economic situation. Even if the actual expenditure can easily be switched to other purposes, the factories, staff and equipment previously devoted to defence are not so easily converted. To be viable, the conversion of existing materials and equipment will require new investment, the development of new activities and a search for new outlets in already highly competitive civilian sectors.

LONG-TERM PRODUCTIVITY

Disarmament must be general. While in the short term it may have adverse economic effects on the arms industries of exporting countries, in the long term its economic consequences ought to be positive if the economic downturn resulting from reduced domestic arms procurement does not become irreversible. If the reduction in military expenditure is well managed, it would even be likely to produce benefits for

civilian research and development, for productivity and for confidence in international trading relations.

Indeed, the economic advantages to be expected from lasting disarmament can in the long run prove very substantial. Econometric models highlight the positive effects, notably if some at least of the resources thus released are trasnferred to the countries of the Third World. Considering the unproductive nature of military spending, it is undeniable that, once the initial problems of conversion have been overcome, the new state of peace will have a positive impact on worldwide economic development.

ROADS TO SUCCESS

Two fundamental conditions must be fulfilled if disarmament for development is to succeed: firstly, some of the resources saved by cutbacks in arms production must be transferred to the countries of the Third World; secondly, it is essential to eliminate the basic causes that impel states to enter into armed conflict.

For countries that have no arms industry of their own, the effects of a reduction in military spending are beneficial in the short term, since the resources hitherto spent on arms purchases can be more usefully employed, but only if the savings thus effected are not hijacked by social groups intent on diverting them to other non-productive uses such as the export of capital or the import of luxury goods. In other words, a transfer of resources is economically worthwhile only if they are channelled into highly productive activity.

Such transfers may, moreover, sometimes have a negative effect by aggravating inflationary tensions. International aid too can have adverse effects if it encourages poor countries to run down their own industries and gradually become more economically dependent, a situation conducive to pauperization. Furthermore, aid that is not disinterested can misdirect development: transfers of resources are often primarily influenced, as concerns the rich countries, by considerations other than the economic development needs of the beneficiary countries.

TOWARDS LASTING DISARMAMENT

Disarmament calls for a series of decisions relating in particular to the international economic order, the nature of development, the direction taken by technological progress, and the distribution of economic resources. Although such matters only rarely figure on the agenda of arms limitation negotiations, the economic development of nations plays a role of fundamental importance to international security. It is involved on at least three counts:

- Firstly, in a world where there is scarcity but there are no international conflicts, military expenditure is a form of waste. The recent experience of the USSR shows that overspending on the military gradually erodes the efficiency of the economic system and in the end reduces a nation's defence potential.
- Secondly, any disarmament dissociated from the reasons that underlie the arms race could in the end prove particularly dangerous for peace or for democratic political systems. Since the great powers can, directly or indirectly, take advantage of their dominant position, any profound change in the strategic balance of forces is liable to transform the international economic map too.
- Finally, when human dignity is threatened, it often happens that nations prefer warfare to inaction. International security cannot be lastingly maintained within a framework of power politics or of excessive economic and social inequalities.

Nor is peace in all cases necessarily preferable to conflict, particularly when that peace is based on tyranny, slavery or exploitation, and on disregard for human rights—but in such cases can it really be called peace? ■

We don't agree **(1993), oil on canvas by the Portuguese painter Baptistantunes.**

GREENWATCH

MAB AT AGE 25

BY MICHEL BATISSE

Just twenty-five years ago, in September 1968, an important conference organized by Unesco was held in Paris. Its full title, the "intergovernmental conference of specialists to study the ideas of modern science on the rational use and conservation of the resources of the biosphere", was something of a mouthful, and for the sake of simplicity it became known as the "Biosphere Conference". It was, incidentally, on this occasion that the scientific term "biosphere" (sphere of life), which until then had been rarely used outside the writings of the Russian geologist Vernadsky and the French philosopher Teilhard de Chardin, began to be more widely used.

A few months before, notably in France and the United States, student movements had challenged the consumer society and heralded the entrance of environmental issues on to the political stage. Fully four years before the big United Nations Conference on the same theme was held at Stockholm, the biosphere conference was the first occasion on which these issues were considered scientifically at intergovernmental level and their worldwide dimension was recognized.

Above, grazing animals in the Serengeti-Ngorongoro Biosphere Reserve (Tanzania). The reserve, and sites shown in photos on pages 26 and 27, form part of the MAB Biosphere Reserve network.

MAB AT AGE 25

Urdaibai (Spain).

Above all, however, it showed for the first time that there was a desire to reconcile the imperatives of the use of natural resources with those of their protection. In other words, at that early date the biosphere conference launched the concept of what is today known as "sustainable development".

Under the dynamic presidency of François Bourlière, former president of IUCN (World Alliance for Nature) and the International Biological Programme, over 300 delegates from some sixty countries and international organizations (such as FAO, WHO and WMO[1]) assembled for the discussions. In the presence of such great pioneers of the environmental movement as Carlos Chagas (Brazil), René Dubos (United States), Viktor Kovda (Russia), Théodore Monod (France) and Barton Worthington (United Kingdom), they thrashed out all the issues, both practical and theoretical, concerning the relationships between human activities and the terrestrial and aquatic environments of the planet.

PRACTICAL RECOMMENDATIONS

However, the conference did not limit itself simply to debates. Since the participants were official representatives of governments, it was able to adopt formal recommendations on all the subjects dealt with. The range and relevance of these recommendations are striking even today.

The first recommendation called on UNESCO to prepare "an international research programme on man and the biosphere". This programme, soon to be known worldwide by its English acronym, "MAB", was naturally based on the work of the conference. It therefore adopted an interdisciplinary approach, linking the social sciences with the physical and biological sciences, and it took into account the specific problems of developing countries. It would also provide a practical follow-up and give a worldwide dimension to the International Biological Programme, which had just entered its final stage. Thus the biosphere conference gave birth—twenty-five years ago—to the research and training programme that is still at the heart of UNESCO's activities relating to sustainable development.

The Man and the Biosphere Programme is governed by an intergovernmental co-ordinating council composed of representatives from thirty countries, elected in rotation, and from the international organizations concerned. Each country participates in the programme through a national committee whose members are representatives of official bodies, universities and research centres. During more than two decades of operational activities, the scientific content of the MAB programme has naturally evolved, but it has retained its primary orientation, namely to seek the most judicious ways of using each country's natural

Isle of Rhum (UK)

resources while ensuring their long-term conservation.

A NEW IMPETUS

Whether it is concerned with tropical forests or semi-desert regions, mountain or coastal areas, pastureland, islands or even urban areas, the MAB programme seeks a comprehensive understanding of the processes triggered by the impact of human activities on the various elements of the biosphere, and tries to minimize their harmful effects. To a large extent, MAB's operations in the field are concentrated in some 300 "biosphere reserves" established in over eighty countries, where efforts are made to combine the conservation of biological diversity with sustainable ways of using natural resources that will benefit the local populations. These biosphere reserves provide the programme with some of its most original and important inputs.

At its most recent session, in January 1993, MAB's co-ordinating council stressed that the programme constituted a "pre-adapted response" by UNESCO to the recommendations set forth in Agenda 21, the action plan adopted by the United Nations Conference on Environment and Development held at Rio de Janeiro (Brazil) in 1992. So, as it celebrates its jubilee, MAB is more necessary than ever and is being asked to take out a fresh lease on life, deploying its wealth of experience and its considerable volume of results, only some of which have so far been analysed in depth.

Chang Bai Shan (China).

Rio Plátano (Honduras)

One thing is very clear: the sapling that was planted by the biosphere conference—with its keywords of globality, interdisciplinarity, systemic and prospective approaches, problem-oriented research, concern for the future and for future generations—will long continue to bear fruit. ■

1 FAO: Food and Agriculture Organization of the United Nations; WMO: World Meteorological Organization; WHO: World Health Organization.

MICHEL BATISSE,
of France, is currently UNESCO's adviser on environmental issues. He was secretary-general of the biosphere conference and organizer of the MAB programme.

PROTECTING QUITO FROM POLLUTION

The capital of Ecuador has a big problem. Dominated by the active volcano Pichincha, Quito could soon be suffering from the same kind of pollution as Mexico City if nothing is done. At present some 80 per cent of the city's air pollution is caused by traffic, and the average lead level in the blood of schoolchildren is three times the maximum set by the World Health Organization (WHO). Two initiatives have been started under the auspices of Fundación Natura (FN), a World Wide Fund for Nature (WWF) affiliate. First, it has developed a plan for tree-planting in the city—previously only 20 per cent of newly-planted trees survived, because no study of suitable species had been made. Second, since engines do not run efficiently at Quito's altitude of 2,850 metres, especially if they are old, FN has brought together drivers and the municipal authorities in an attempt to establish and enforce new norms. It is also training professional drivers and seeking to improve fuel quality. ■

A PRIZE FOR "CLEAN UP AUSTRALIA"

The United Nations Environment Programme (UNEP) has awarded a prize to Ian Kierman, leader of a project called "Clean up Australia." After tidying up the port of Sydney, each year some 400,000 volunteers are removing litter from roadsides, watercourses and parks throughout Australia. Ian Kiernan has since embarked on an even more ambitious project called "Clean up the World." He intends to draw the attention of the international community to waste disposal, which poses the same problems all over the world. ■

LUCKY CRABS

The region of Antsalova on the west coast of Madagascar (below) has been listed as a world heritage site by UNESCO. A conservation and development project aimed at making the most of the area's ecological resources is already underway in this remote, sparsely populated area, which is very rich in endemic flora and fauna. Although swimming crabs (*Scylla serrata*) are heavily fished and eaten locally, they have not so far been exported to Europe because the fine skin which surrounds their flesh is brown and not pink like that of the crabs that tickle the palates of gourmets in that continent. Because of this anatomical detail these plump mangrove crabs have so far escaped decimation by intensive fishing. ■

FRAGILE ECOSYSTEMS

In the United States 4,200 out of some 20,000 native plant species are threatened with extinction, including some 750 within the next ten years because their habitats are being destroyed or degraded. To save as many as possible, conservationists are sowing their seeds in places where they have not hitherto grown. However, these introductions are proving surprisingly controversial. What if an endangered species introduced into a new environment begins to crowd out its neighbours, threatening them in turn with extinction? There is also the risk that a specialist trying to save a specific plant by introducing it into another ecosystem may be tempted to see its new environment as an adversary to be manipulated. The risks and difficulties of reintroduction are leading to a growing awareness that more care should be taken to avoid the destruction of existing habitats in the first place. ■

A HAIRY NOSE FOR STAMP-COLLECTORS

To mark its 45th anniversary this year, the United Nations Postal Administration issued a series of stamps on 3 March showing endangered animal species, which the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)—so far ratified by 115 nations—is trying to protect. Twelve species will be featured each year on superb stamps designed by well-known animal painters. The star turn this year is the hairy-nosed wombat of Queensland, Australia, a marsupial rodent whose population is down to only about one hundred. Others will include the snow leopard, Grevy's zebra, the desert monitor, the Amazonian manatee and the peregrine falcon. To obtain the stamps, sold in three blocks of 16, contact the United Nations Postal Administration, Palais des Nations, CH-Geneva 10, Switzerland. Tel. 022 917 38 25. Fax 022 917 00 24. ■

OECD AND PESTICIDES

The theme of the April 1993 "Greenwatch" dossier was pesticides. A Belgian reader has written to scold us for not condemning these potentially dangerous products more roundly. Their use is often indispensable, however, as when crops are invaded by locusts, for instance. The Organization for Economic Co-operation and Development (OECD) is preparing to launch in January 1994 a three-year programme whose aim is to reduce risks by gradually phasing out use of the most dangerous pesticides, to promote a general reduction in pesticide use, and to encourage the wider use of other methods of destroying pests. ■

SORTING OUT THE RUBBISH

Since June 1991, the population of Colonia Valdense (Uruguay) has been receiving leaflets explaining why household waste is being collected on a selective basis, and a timetable of dates throughout the year when glass, metal, paper, plastic and organic rubbish will be taken away. Profits from selling these wastes for recycling pay the costs of spreading the message and manufacturing containers, which are strategically placed in public places. Local schools are associated with these activities, which feature regularly in the media. The initiative was launched by DEMAVAL (*Defensa medio ambiente Valdense*—Valdense Environment Protection), a non-governmental organization headed by *Unesco Courier* reader Omar Esteban Pita, to whom we are indebted for this information. To find out more, write to Señor Pita at Avenida Artigas s/n 70202, Colonia Valdense, Uruguay. ■

INITIATIVES

"Initiatives" is a feature designed to highlight examples of environmental action in different parts of the world. We invite readers to send us details of their own experiences in this field for possible publication in the column.

A GREENHOUSE FOR LIVING IN

THE Venice Biennale of Modern Art sprang a surprise this year with the Israeli Pavilion, which was designed by Avital Geva, an Israeli artist who lives on the Ein Shemer kibbutz, not far from Hadera. The pavilion took the form of a large experimental greenhouse covering 1,700 square metres. A pond stocked with five species of carp and watered at regular intervals by artificial rain was overhung by cucumber plants growing in pots fixed on hollow pipes, and whose flower- and fruit-laden stems cascaded to the ground. Along a system of water-filled channels grew a special variety of "spelt" or primeval wheat, whose medicinal powers are currently being studied. Suspended three metres above the ground, these crops were watered by a dropper mechanism specially designed to economize on water. The five carp species were not only an excellent source of proteins; they also ate any mosquito larvae they found in the water, thus preventing the spread of these insect pests.

After studying painting in Tel Aviv and exhibiting at many shows, Avital Geva retired in 1978 from the world of art, which, he felt, was incapable of solving the problems of society. Under the patronage of an educational institution, "Mevo'ot Iron," he assembled dozens of youngsters from other kibbutzim and set them to work on an equal footing with leading specialists from agriculture and industry. His ambition was to make the most of the "hamama"—the greenhouse. It was in this spirit that he designed the greenhouse for the Ein Shemer kibbutz, of which the Israeli Pavilion at Venice was a replica.

It is a very special kind of greenhouse. Various kinds of research are undertaken there, particularly on the simultaneous breeding of different species of fish, the use of solar energy, the recycling of water, and finding alternative substrata for crop-growing. The greenhouse is also intended to be a place where team members can meet and discuss their ideas: in an area kept cool by the artificial rain, large armchairs in light-coloured wood are arranged around low tables.

In this way Avital Geva seeks to redraw the frontier between art and life, between art and nature—and even to challenge the art world itself. There is nothing utopian about his work. On the contrary, it proves that a place may be both beautiful and socially useful, while at the same time offering many possibilities for research into ways of improving the environment. ■

The Israeli pavilion (Venice, 1993).

In spite of efforts to impose restrictions, the international arms trade is still flourishing

The business of war

by Christophe Carle

Jet fighters on patrol.

ARMS transfers from the industrialized countries to the countries of the Third World have long constituted the bulk of the international arms trade. Although the end of the Cold War and the Gulf War have profoundly altered the dynamics of that trade, these changes are still too recent for us to be able to clearly discern all the consequences. What is clear, however, is that the principal arms producers are facing a new and increasingly acute dilemma: how can the economic interests involved in the export of military hardware be reconciled with the requirements of non-proliferation and security?

Ever since the Iran-Iraq War and the Gulf War, the problem of arms proliferation has been at the forefront of international security issues. It is a problem that encompasses the entire range of ballistic, chemical or biological, and nuclear weapons. These so-called non-conventional devices are already covered by a series of non-proliferation measures. The question of conventional weapons, on the other hand, deserves

***L'imprudence* (1991), acrylic on canvas by the Zairian painter Cheïk Ledy.**

closer consideration, the Gulf War having once again underlined the importance of technological superiority in conventional weapons in the air, on land and at sea. Yet attempts to limit the trade in these weapons—the most commonly manufactured and sold throughout the world—are of very recent origin.

OTHER TIMES, OTHER WARS

During the Cold War, the production of conventional weapons was stimulated by East-West antagonism. The biggest manufacturers were also the biggest exporters. For those countries, providing the Third World with arms was all part of the bipolar competition in which they were engaged on a global scale. If one belligerent, in any part of the world, received arms from one of the two blocs, its adversary was practically sure of obtaining support from the opposing bloc. The superpowers thus competed for influence on the periphery of their zones of direct confrontation, a situation which also suited the states engaged in regional confrontations.

That situation no longer exists, but the flow of arms to the Third World has not dried up. Tensions other than those fuelled by the former East-West conflict still exist all over the world, stimulating a demand for arms in certain developing countries.

CHRISTOPHE CARLE, a French specialist in regional security questions, is engaged in research at France's Institute of International Relations (IFRI).

The Middle East is of special, though not unique, importance in this respect. Two years after the invasion of Kuwait by Iraq, most of the nations in the Gulf region, conscious of the inadequacy of their own armed forces, have been buying arms on the international markets, and the other countries of the region are also restocking and reinforcing their arsenals.

A CODE OF CONDUCT

The Gulf War did, however, inspire new thinking and a series of political initiatives at the highest level to try to curb the delivery of weapons to the Middle East and avert the risk of upsetting the balance of international security. The example of Iraq, overarmed to a point where it was emboldened to invade a neighbour state, thus triggering a war in which the whole planet was to some extent involved, speaks for itself. Various proposals aimed at reducing the arms trade have been drafted in recent years by a number of Western prime ministers and heads of state, and the European Community leaders discussed these matters at their meeting in Maastricht in December 1991.

Following up these initiatives, two procedures have been adopted. In the first place, the five permanent members of the United Nations Security Council have agreed to meet periodi-

The five permanent members of the United Nations Security Council have agreed to meet periodically in order to draw up a common "code of conduct" bearing on the export of conventional weapons.

cally in order to draw up a common "code of conduct" bearing on the export of conventional weapons. Together, these five states accounted for over 80 per cent of the conventional weapons exported to the Third World over the last five years. This readiness to consider the question from a new angle is a first encouraging sign.

As a second measure, on 9 December 1991 the UN General Assembly adopted a resolution relating, among other things, to "transparency in armaments" and a "Register of Conventional Arms", whereby the member states of the UN are henceforth required to provide an annual inventory of all imports and exports of arms during the previous twelve months.

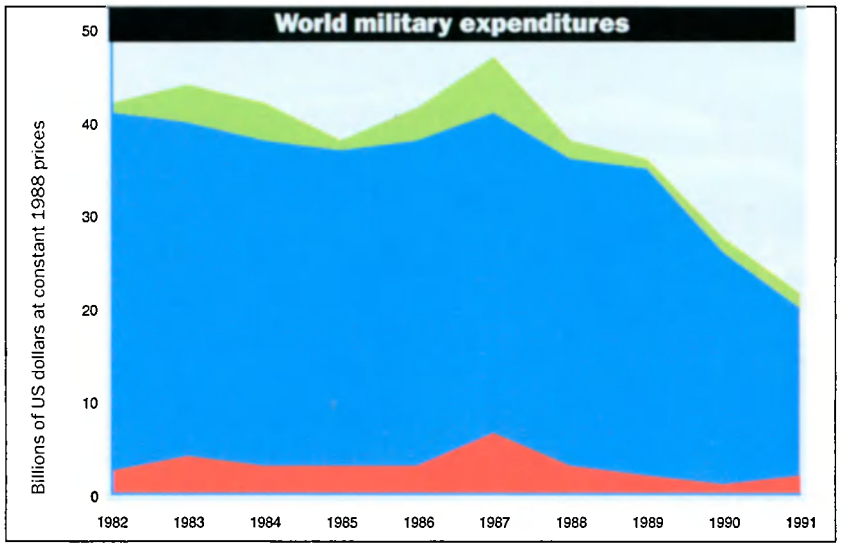
Although several meetings of the Security Council have been held to discuss this matter, the five permanent members have not succeeded in arriving at a clear, agreed definition of matériel considered as "destabilizing"—a decision which would have made it possible to ban its export—nor have they managed to agree on mutual notification procedures about their exports. In any case, there is little likelihood of such information being exchanged prior to the signature of possible export orders, and this considerably limits the scope of the negotiations.

A FREE MARKET IN EXPORTS

The current outlook for an agreement among the suppliers of conventional weapons to the countries of the South is not bright, essentially because of the economic and commercial conditions already mentioned.[1] While it is true that the case of the Iraqi weaponry that was turned against some of its principal suppliers in the battles of the Gulf War has underlined one of the risks that can result from an arms race in the Third World, it must be said that the arms-producing states are still irresistibly drawn towards export markets to compensate for shrinking domestic demand for military hardware.

In the East, the same commercial logic as in the West works in favour of arms exports, present and future. In a situation of shrinking budgets, stagnant or sluggish economies, or pressing need for convertible currency, such exports seem to be the only means of guaranteeing the security of jobs in high technology sectors and

A British missile base.



of preserving the viability of the conventional arms industries.

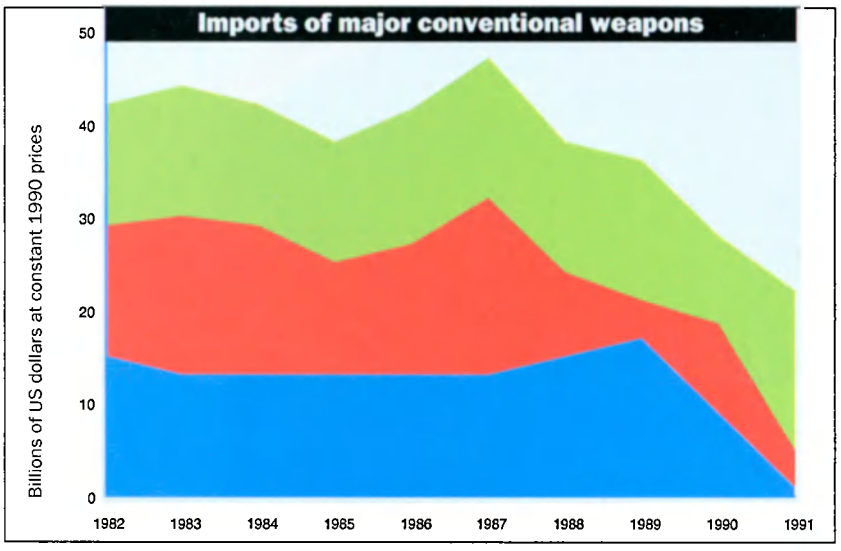
In short, despite their stated attitudes towards non-proliferation, the principal arms producers are engaged in an ever keener competition for export markets, which incidentally means that they are willing to accord numerous compensatory measures to purchasers, most often in the form of transfers of technology and licensing agreements.

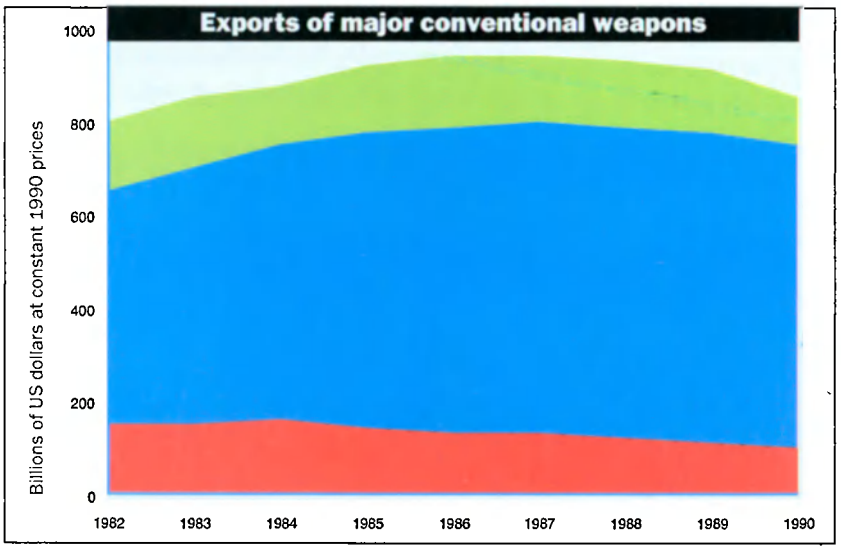
Other, more ambitious states are still intent on devising and producing their own weaponry—Taiwan, for instance, is pursuing its project for a combat plane known as the "Indigenous Defense Fighter" (IDF)—but even they remain dependent on inputs of foreign technology. Moreover, certain countries of the South that a few years ago seemed likely to become important new arms producers have been unable to stand up to the competition from the countries of the industrialized North which alone can hope to continue footing the massive bills for designing and producing high-tech conventional weapons.

The future of the arms export business will thus depend essentially on the policy of the principal producers, who have declared their intention to limit the international arms trade. But since each export order signed is one more incentive for escalating a spiral of free competition, for the present one can but note the gap that separates words and deeds.

As for the immediate future, only two factors could help to restrain arms transfers: the lack of financial resources among potential Third World purchasers, and the desire of the main producers to keep the market in the most sophisticated weapons for themselves, at least for the time being.

As for the new UN Register, its function at present seems likely to be limited to recording the continuation of existing trends. ■





1 See the article by Jacques Fontanel on page 20.

To check the spread of nuclear weapons, we must stop thinking that they are synonymous with security

The bomb or peace

by Jasjit Singh

Above, *Illumination of Peace*, papier collé by the Indian artist V. Balu.

CHANGES in the global political architecture during the past few years have led to a number of agreements to reduce nuclear weapons. The threat of a nuclear war and global holocaust has receded. On the other hand, the unmasking of the nuclear weapon programme pursued by Iraq for many years, unknown and undetected in spite of regular inspections by the International Atomic Energy Authority, has generated renewed concern about nuclear proliferation.

Proliferation means different things to different people. The five acknowledged nuclear weapon states—the United States, the former USSR, China, France and the United Kingdom, see the problem essentially as one arising out of

the spread of nuclear weapons to other states: in other words, "horizontal" proliferation. Most other states see the problem as far more complex, although no consensus view exists. The fact that 157 states are now parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) which was signed in 1968 is an indication of this widespread concern. It also highlights the commitment of the five nuclear weapon states to total nuclear disarmament and reflects the expectations of the non-nuclear weapon states that this commitment will be honoured at an early date.

The real problem is that for more than forty-five years the world has been led to believe that nuclear weapons have kept the peace in Europe. The United States and NATO justified their nuclear weapons strategy as necessary for their security against the perceived threat of the Soviet Union's massive conventional forces and, later, the combination of nuclear and conventional forces. There is no way of testing this proposition, but its logic has appealed to many other states and their decision-makers.

A very large number of states do not have the means to acquire nuclear capability, or lack sufficiently strong security incentives to do so. Others have been coupled in the past to the nuclear weapons of the two superpowers. But a powerful logic in favour of acquiring nuclear weapons for their own security has been operating in many states, which have been swayed by the rationale of nuclear deterrence. In such situations a "ripple effect" takes place as other, neighbouring countries feel obliged to acquire nuclear weapons in their turn.

Besides the security incentive, nuclear weapons have acquired a certain aura in the international system. The five permanent members of the United Nations Security Council are nuclear weapon states, and there have been many incidents in which a state has used nuclear weapons as an instrument of policy to coerce others. These and other factors create incentives for proliferation, which is a source of instability.

There is no intrinsic reason to suggest that only the states of the North can act in a respon-

Uniforms for sale in a Moscow street.

War/Peace (1989), a collage by the American artist Pat Horner.

sible manner, although unfortunately the debate normally implies this. China, a major state of the South, has possessed nuclear weapons for the past twenty-five years. But an increase in the numbers of those who control nuclear weapons inevitably carries serious risks, not least those arising from miscalculation and accident. There is thus no reason to disagree with the prevalent view in the North that any increase in the number of nuclear weapon states is destabilizing. However the problem cannot be resolved by addressing the question of horizontal proliferation alone.

FLAWS IN THE NON-PROLIFERATION TREATY

The NPT is the only non-proliferation regime that has so far been established. The general view, especially in the South, is that the Treaty is discriminatory, but this is only a small part of the problem. NPT has failed to meet its own stated objectives, especially when judged against three critical yardsticks—sound principles, efficiency, and security interests. The number of warheads proliferated from less than 12,000 in 1968 to 55,000 twenty years later. The twin objectives of non-proliferation and disarmament set out in the NPT have not been met. This makes it necessary to establish a more viable non-proliferation regime for the twenty-first century.

The NPT has also given nuclear weapons a certain legitimacy, while at the same time tending to provide a false sense of security. States which adhere to the Treaty as non-nuclear weapon states are believed to be such, although the reality may be different, as Iraq's example shows. South Africa clandestinely built up a stockpile of at least six nuclear weapons. It joined the NPT in July 1991; its denuclearization will remain under question. North Korea signed the NPT in 1985 but is pursuing a weapon-related programme. Iran is a party to the Treaty but is suspected by some of having a weapon-related programme.

THE COLLAPSE OF THE USSR

The disintegration of the USSR has led to unprecedented risks of nuclear proliferation, opening three major areas of concern.

Firstly, there is widespread uncertainty about the extent of control being exercised over nuclear weapons. On 21 December 1991 the leaders of eleven former Soviet republics signed the Alma Ata Accord in which it was agreed that decisions about the use of the strategic nuclear forces of the Commonwealth of Independent States (CIS) would be made by the Russian president "with the agreement" of the leaders of Ukraine, Belarus and Kazakhstan—and after "consultation" with other Commonwealth leaders. Actual control of the "nuclear button" is believed to rest with Marshal E. Shaposhnikov, the commander of CIS Strategic Deterrence Forces, and President Boris Yeltsin. The system does not have the reliability of NATO in the sense that there are no institutionalized political controls

It is becoming feasible to construct a world without chemical weapons, and to go from there to a nuclear-weapon-free world is only a few steps down the same path.

between Russia, Ukraine, Belarus and Kazakhstan. Nor can the stability of these states be taken for granted. Russia has been resisting multilateral controls even on the processes of dismantling nuclear weapons.

Secondly, it is hard to predict the effects of Russia's domestic crisis on the mechanisms for controlling nuclear weapons within the country. In the former Soviet Union, control over nuclear weapons was maintained through a balance of tensions between three mutually reinforcing pillars of the power structure—the Communist Party, the KGB and the military. Today the Communist Party is disbanded, and a stable political framework has yet to be firmly established. The KGB, which traditionally controlled the nuclear warheads, has undergone a fundamental transformation. The military has been severely affected by the dissolution of the USSR and the social and economic problems this has caused. It was generally believed that Soviet theatre military commanders possessed delegated authority to use nuclear weapons in their jurisdiction. There is little to suggest that this has changed. In the West concern has focussed essentially on the fate of strategic weapons in the former Soviet Union, but nearly 17,000 non-strategic nuclear warheads constitute a more serious danger. Control over these weapons has inevitably been far more diffused and uncertain.

Thirdly, the continuing social and economic crisis in the former USSR has increased the risk of leakage of nuclear weapon technology and know-how. A nuclear brain drain could reinforce clandestine weapons programmes. New trends in ethno-religious nationalism may provide further incentives to nuclear proliferation.

THE DANGERS OF PROLIFERATION

It was the transformation of political relations between the United States and the Soviet Union that made real progress possible in nuclear arms reductions, rendering START itself obsolete even before it was signed. Political relations, rather than weapons *per se*, are the critical factor in international security.

The biggest problem with nuclear weapons may be described as one of asymmetry of capabilities. Asymmetry creates greater complexities and uncertainties in multi-polar situations where nuclear weapons of one state have implications for a number of others. Inevitably asymmetry increases with the increase in the number of nuclear weapon states, creating instability and providing a powerful incentive for proliferation.

Instability and proliferation, therefore, are closely linked. Broadly speaking, stability can be enhanced only through one of two diametrically opposite methods—global nuclearization by extensive horizontal proliferation which could keep the peace on the so-called European model of nuclear deterrence, or denuclearization through

Soviet leader Mikhail Gorbachev and President George Bush of the United States sign understandings on nuclear arms cuts at the White House on 1 June 1990.

Glossary

CFE Treaty: The Conventional Armed Forces in Europe Treaty, signed on 19 November 1990, came into force on 9 November 1992. Sets ceilings on treaty-limited ("conventional" or non-nuclear) equipment in the Atlantic-to-the-Urals zone. 29 states parties, including the former Soviet republics since 1992.

CSCE: Conference on Security and Co-operation in Europe. Began to meet in 1973 as a forum for matters relating to security, human rights and economic and scientific co-operation in Europe. 51 member states (all the European states plus the United States and Canada and the former Soviet republics).

IAEA: International Atomic Energy Agency. Established in 1957 by the UN to promote the peaceful uses of atomic energy and to ensure that nuclear activities are not used to further any military purpose, it has 113 member states.

ICBM: Intercontinental ballistic missile (range in excess of 5,500 km). **IRBM:** Intermediate-range ballistic missile (range of from 1,000 up to and including 5,500 km).

NATO: North Atlantic Treaty Organization. Established by a Treaty signed by 12 states in Washington on 4 April 1949, it now has 16 members: Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Turkey, the United Kingdom and the United States. (France and Spain are not in the integrated military structures of NATO).

NPT: Treaty on the non-proliferation of nuclear weapons, signed on 1 July 1968; came into force on 5 March 1970. It prohibits nuclear weapon states from transferring to other states nuclear weapons or the means of manufacturing or acquiring them. 156 states are parties to the Treaty.

SALT: Strategic Arms Limitation Talks. Negotiations between the United States and the USSR which sought to limit the strategic nuclear forces of both sides and resulted in two treaties. The SALT I Agreements and the ABM Treaty limiting the development, testing and deployment of Anti-Ballistic Missile Systems were signed in 1972. The SALT II Treaty was signed in 1979 but never ratified.

START: Strategic Arms Reduction Talks. US-Soviet treaty, signed on 31 July 1991, which reduces US and Soviet offensive strategic nuclear weapons. In view of the new political situation in Eastern Europe, a protocol was signed at Lisbon on 23 May 1992 by the United States, Belarus, Kazakhstan, Russia and Ukraine.

TNF: Theatre or tactical nuclear forces (also called non-strategic nuclear forces). Nuclear weapons with ranges of up to and including 5,500 km. The US-Soviet Intermediate-range nuclear forces (INF) Treaty of 1987 obliged the United States and the USSR to destroy all land-based missiles with a range of 500-5,500 km (intermediate range and shorter-range) and their launchers by June 1991.

UN: United Nations Organization. International organization established in June 1945 by the San Francisco Treaty in succession to the League of Nations, which was officially dissolved in July 1947. It seeks to maintain world security and peace and works on behalf of international co-operation for economic and social progress and respect for human rights. Its principal organs are the General Assembly (where each of the 183 member states has one vote), the Security Council (five permanent members: China, France, Russia, the United Kingdom and the United States, plus ten members elected for two years), the Secretariat, the Economic and Social Council (54 members elected by the General Assembly for three years), and the International Court of Justice.

WTO: The Warsaw Treaty Organization, or Warsaw Pact, was established in 1955 by a treaty of friendship and mutual assistance between 8 countries: Albania, Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, Rumania and the USSR. Dissolved on 1 July 1991.

Sources: United Nations, Stockholm International Peace Research Institute (SIPRI)

complete and global nuclear disarmament. It is obvious which one would be the better option.

Denuclearization has traditionally been considered too idealistic on the grounds that nuclear weapons cannot be disinvented, and in theory the problem of the rogue state and violations would always remain. However, the Chemical Weapons Convention now awaiting approval by the United Nations General Assembly is quite relevant here and could be taken as a model for dealing with the threat of nuclear weapons. One of the most positive results of the end of the Cold War, this Convention is based on the principles of universality and comprehensiveness and includes provisions for extensive verification and routine inspection. This is particularly important since chemical weapons are easier to manufacture than nuclear weapons, and even the less developed states of the South have some access to technology and resources to develop them because of the extensive and expanding chemical industry. Violations of non-proliferation agreements concerning nuclear weapons would thus be far easier to check than those concerning chemical weapons.

It is becoming feasible to construct a world without chemical weapons, and to go from there to a nuclear-weapon-free world is only a few steps down the same path. Denuclearization, however, will have to be dealt with on the conceptual as well as the physical level. The problem with nuclear weapons is that belief systems have been built up to support the idea that they are usable and indeed almost indispensable to international security. If the dangers of proliferation are to be addressed on a durable basis, steps must be taken to counter these ideas. The real dangers of nuclear proliferation stem from nuclear fundamentalism.

Nuclear fundamentalism needs to be tackled at the conceptual level. This is why 138 states, mostly of the South, have been regularly voting at the UN since 1978 for a convention to outlaw the use and threat of use of nuclear weapons. This would be the most powerful method of delegitimizing nuclear weapons and eroding the concept of their utility. At the same time, methods of maintaining national security need re-examination.

In defence of their sovereignty nation-states have traditionally sought to enhance their own security at the cost of the security of other states. Nuclear weapons, of course, represent an extreme example of this process. The result is a *competitive security* framework that seeks to create and exploit vulnerability in other states. This approach should be replaced by a move towards a *co-operative security* framework in which the security of each side becomes of equal importance, the two sides make allowances for each other's minimum needs, and co-operate not to raise each other's levels of insecurity. This would represent a comprehensive model of collective security. ■

JASJIT SINGH,
of India, is director of the Institute for Defence Studies and Analyses in New Delhi. A member of India's National Security Advisory Board, he is the author of several works on defence, including *Air Power in Modern Warfare*.

UNESCO IN ACTION
NEWSBRIEFS

JORGE CHAMINÉ SINGS FOR BOGOTÁ STREET CHILDREN

The Spanish baritone Jorge Chaminé will sing works by Joaquin Turina, Claudio Carneyro, Joaquin Nin, "Modinhas" Luso and Carlos Guastavino at a concert to be held at UNESCO Headquarters in Paris in aid of the street children of Bogotá (Colombia). All proceeds from the concert will go to an association called "La Bergerie", which has since 1987 been providing shelter, medical care and training for abandoned children in a number of centres in and around the Colombian capital. The concert, on behalf of an effort jointly supported by UNESCO and the United Nations Children's Fund (UNICEF), will take place on 12 October 1993. For further information please call: 45 68 17 18 or 45 68 17 19.

AID TO CHERNOBYL VICTIMS CONTINUES

On 28 April 1986, one of the reactors at the Chernobyl nuclear power plant exploded, contaminating hundreds of thousands of hectares of forests, lakes, rivers and arable land in the republics of Ukraine and Belarus and in the Federation of Russia and exposing many thousands of people to potentially harmful doses of radiation. In response to the call of the three republics for international assistance, a UNESCO-Chernobyl Programme was created in 1990. Of 70 projects proposed as part of the programme, 30 are now underway, notably through the establishment of nine pilot psychological rehabilitation community centres, the development of an Economic and Social Development Area in Russia and of facilities to build prefabricated housing.

UNESCO LITERACY AWARDS FOR 1993

On International Literacy Day (8 September), Indian President Dr. Shankar Dayal Sharma presented UNESCO's literacy prizes for 1993 at a ceremony in New Delhi attended by the Director-General of UNESCO, Mr. Federico Mayor. Dr. Sharma, who noted that "Literacy and National Integration" was the theme chosen for this year's Literacy Day in India, presented the Noma Prize to the Indian National Federation of UNESCO Clubs and Associations, the King Sejong Literacy Prize to the Illiteracy Eradication and Adult Education Project of Jordan's Ministry of Education, and the International Reading Association Award to the Sebenta National Institute of Swaziland. All three winners have been actively promoting community participation, distributing literacy material and conducting adult literacy classes in rural areas in their countries.

A UNESCO REPORT ON EDUCATION FOR ALL

The first of a series, a new report by UNESCO entitled "Education for All: Status and Trends" has been produced as part of UNESCO's responsibility to monitor progress towards the goals adopted by 155 countries at the World Conference on Education for All held at Jomtien (Thailand) in March 1990. The report ranks developing countries according to their net enrolment ratio for primary schooling, defined as the number of pupils in the primary-school age group who are enrolled in school, expressed as a percentage of the total population of that age group. According to the report, there are also an estimated 948 million illiterate adults worldwide. However, UNESCO estimates that if present trends continue, this figure will drop during the 1990s to about 935 million by the end of the century. Published by UNESCO for the International Consultative Forum on Education for All, the report gives an overview of the situation of basic education and the direction it is taking. It is available on request from the Press Room, Office of Public Information, UNESCO, 7 Place de Fontenoy, 75352 Paris 07 SP, France. Tel: (33-1) 45 68 17 45 and 45 68 17 46; Fax: (33-1) 44 49 06 92.

WORLD HERITAGE DESK DIARY 1994

The 1994 UNESCO World Heritage Desk Diary, now on sale, contains superb full-colour photos of monuments, sanctuaries and national parks included in the World Heritage List, with explanatory texts in English, French and Spanish. By offering this desk diary as a gift you will also help to preserve the artistic and natural heritage of mankind. Format: 17 x 23.5 cm, 72 pages. Price: 92 French francs (including postage). Orders should be sent to: UNESCO, Sales Division, 7 Place de Fontenoy, 75352 Paris 07 SP, France.

CORRECTION

In our September 1993 issue, *Rhythm, gesture and the sacred*, information given in the caption to the photos (pages 34-35) of Indian symbolic hand gestures (*mudras*) was erroneous. The caption should have read as follows: "Clockwise from photo below: peak; tortoise; open lotus; half moon; a parrot's head, the head of a deer." We apologize for this error. ■

COMMENTARY by Federico Mayor

This article is one of a series in which the Director-General of UNESCO sets out his thinking on matters of current concern

CULTURE FIRST AND LAST

THE fundamental role of culture in development, in the building of peace and democracy, and in the preservation of the environment is now starting to appear in large letters at the top of the international list of priorities.

Culture used to be a flower. Then it grew into a tree. Now it has become a fruit. What was yesterday a mere ornament is today the very centre and soul of the human adventure. We used to look upon it as an adjunct; we are coming to see that it is the heart of the matter. And so there is a need for a new approach to development that will at last recognize the decisive role of culture.

With the support of the United Nations, UNESCO has created a World Commission on Culture and Development, thereby responding to one of the major challenges of the twentieth century. The Commission's task will be to look closely at the links between culture and development, and to prepare a report on the global situation. This is something quite without precedent: never before has the relationship between culture and development been the subject of comprehensive, coordinated study on a world scale.

Sceptics will say "if you want to bury a problem, set up a committee!" UNESCO and the United Nations are doing the opposite. What is more, they are following the example set by the Brundtland Commission, which proved the blasé and the cynics wrong. It is largely thanks to the Brundtland Commission that the need for sustainable development has gradually become accepted, that it was roundly endorsed at the Rio Summit and that no leading politician can now afford to ignore the problems of environment and development.

The work of the new Commission will also be action-oriented. Its recommendations are intended to serve as guidelines for policies in every area where development and culture meet. The task will not be easy. As everyone knows, it is hard to define culture, perhaps because culture defines us rather than the other way round. A leading philosopher of our time, Jacques Derrida, who is taking part in the public hearings of the Commission, has said that culture is the name we give to the unfathomable enigma confronting those who peer into its depths.

The task of the Commission is nonetheless important, indispensable even, firstly because much of the world today is suffering from the *development crisis* that certain far-sighted thinkers such as Edgar Morin forecast fifteen years ago. Old dogmas and ideas that were taken for granted, the conventional wisdom about stages of growth, the notion of importing off-the-peg development models—all that has flown out of the window. What we need now is a radical rethinking of development if we are not to find ourselves entering the twenty-first century in a state of disarray.

Secondly, it is quite clear that the *relationship between culture and development* lies at the heart of the problem, and equally clearly it is at the point where culture and development interact that we will find the beginnings of a solution. If culture and development pull in different directions, as in Plato's image of the team of horses, each will cause the other to fail. If development collapses, culture itself is doomed to decline, or worse still may be tempted to withdraw into seclusion and sink into mindless violence. It is only when each community is at ease with a specific system of values inseparable from its culture and heritage that the linkage between the economic and cultural aspects of development can be re-established.

If, on the other hand, we deceive ourselves into believing that culture is the be-all and end-all of development, many dangers lie ahead: the danger of the trivialization of culture through the commercialization of images; of cultural erosion under the onslaught of standardized models of development; of a severing of the dialogue and interaction between cultures and of their giving way to hatred and violence; of the triumph of tribe over nation, the Pyrrhic victory of fanaticism over co-operation; of the danger that closed minds will triumph over open ones, and that the dead hand of conformity will stifle the spirit of creativity and innovation. Contemplating the bloody revolutions of his age, Victor Hugo spoke of "this grim readiness to die."

Dostoyevsky believed that beauty would be the salvation of the world. Culture no more offers salvation than do education or beauty, but it contributes to it, and I have every confidence that the World Commission on Culture and Development, working in complete independence, will help to ensure that the power of culture will enlighten us and suggest to us ways of creating a world where it will be better to live, a world with a greater sense of solidarity, a world more receptive to all that is best.

PEACEFUL SOLUTIONS

Far from getting in the way of development, culture is its source, as history abundantly confirms, from ancient China to the European Renaissance and the Enlightenment, from the Islam of medieval times to the Japan of the Tokugawa and Meiji eras. Culture is not an obstacle to development, to be negotiated or destroyed; it is its opportunity and its stimulus. It is the mainspring, the horizon and the goal of all human transformation.

Without culture as its foundation and its goal, development will go the way of all ephemeral creations, like a ghost town abandoned after a gold rush. Culture is not just development's "accession of soul": it is its very heart and soul, the heart and soul that both South and North need to rediscover together by drawing up the "cultural contract" of solidarity and sharing which Javier Pérez de Cuéllar, President of the new Commission, has so well described.

It would be hard to imagine anyone better endowed than he with the necessary skill, natural authority, breadth of vision, moral standing, impartiality and readiness for dialogue that are indispensable for such a task.

History mostly records the names of generals who won battles but seldom preserves the names of those who excelled in avoiding them. Javier Pérez de Cuéllar is a fortunate exception to that rule. During his two terms of office as Secretary-General of the United Nations, he was successful—whenever the cards he held allowed him to do so—in extinguishing the fires of war and lighting the lamps of peace. A man of harmony, he gave decisive impetus to the peaceful solution of many conflicts.

If one day we decide to stop recording the history of wars and massacres and to write the history of peace—an account of how generosity, love, modesty, wisdom and the silent virtues overcome cruelty, hatred, unbridled lusts and fascination with death—I am convinced that one of its finest chapters will be devoted to Javier Pérez de Cuéllar. And I trust that chapter will include a memorable account of his work at the head of the World Commission on Culture and Development. ■

Goethe, a mind for the universal

The Committee on Arts and Letters of the International Institute of Intellectual Co-operation organized a symposium on Goethe in Frankfurt from 12-14 May 1932 to mark the centenary of the German poet's death.[1] The eighteen speakers,[2] who addressed topics as varied as the poet's interests, all reached the same conclusion in differing but consensual terms: the versatile author of Werther *had a central preoccupation which we have called a concern for universality—a continuing urge to achieve harmony and reconcile opposites, and joy in the richness of unity in diversity.*

Goethe visiting the Coliseum in Rome,
a painting by the German artist Jacob Philipp (1737-1807).

Texts selected and presented by Edgardo Canton

"Seen from the summits of pure reason," wrote Goethe, "the whole of life seems to be a nasty illness, and the world is like a madhouse." That was a real writer's expression—an expression of pained impatience with humanity, such as is often met with, more often than is generally supposed, in Goethe's works. . . .

Goethe's works contain many passages in which he complains of the pain inflicted on him by nastiness and stupidity: there are many more of these passages than might be expected or than it would be fitting to quote, especially since we know from the example of Goethe himself how courtesy and kindliness can help in the task of reconciliation. To use a stronger and warmer word for this kindliness, we may call it love. Goethe was aware that intelligence and art without love amount to very little, that they cannot exist without it, and that intelligence cannot live with the world or the world with it unless it possesses love.

This love takes the form of considerateness, tenderness, kindness and a desire to treat others gently that is typical of Goethe. . . .

But here I want to mention a thought, a tendency and an idea that make up the main expression of the mind's love of life, namely educational thought. Goethe was a true educator, as witness the two great monuments of his life, *Faust* and *Wilhelm Meister*. The latter work in particular shows

by Thomas Mann, Georges Opresco and Paul Valéry

how the impulse that drove him to pen his autobiography as a confession and self-portrait became objective, was externalized in the social and even the political sphere, and so acquired educative value.

This impulse and this educative vocation were not, however, born of inner harmony but were the result of the inner conflicts that perturb the Ego, the discords it contains, the difficulties it undergoes, and the struggle with itself on which it has embarked and which it needs to confess. The poet-writer is an educator in the sense that he expounds problems which are not part of everyday life but which nevertheless are apt to portray or express the ideas of the human community. "When the particular portrays the general", wrote Goethe, "that is true symbolism." . . .

A writer may be defined as an educator whose own education has followed the strangest route; education in his or her case always goes hand in hand with the fight against the self. The innermost being and the outside world become confused in this struggle against both the Ego and the world, and a purely objective education by a perfect teacher is but empty pedantry.

THOMAS MANN

Cover of a booklet containing the proceedings of the symposium held by the International Institute of Intellectual Co-operation in 1932 to mark the centenary of Goethe's death.

HUMANITY looks at itself in [Goethe] and knows no finer image of itself. He is both a summit and a frontier of the mind. And yet no-one was as fond of the genius of the people, the fresh, spontaneous work of humble peasants, as this god of the intellect. . . . He set out to encompass the whole vast field of folk literature, to make contact with the most outstanding creations of the most remote nations, those which history has placed in exceptional circumstances or which have lived far removed from all civilizing influences. . . .

The poet by no means commands all the tongues from which he takes the poems he translates; but even though he does not know their exact meaning, his instinct comes to his aid. Not understanding a word of the original, and using a translation sent him by a kind correspondent, he manages to render its rhythm, its sonority and even its word order—in short, the essential shape of a poem. It is for him an amusing and very instructive game to see how ancient universal themes are interpreted by the most diverse nations. . . .

For Goethe, folk poetry is only part of a wider whole, and for all its beauty it has no real value except insofar as it helps us to understand this whole, establish its laws and define its boundaries. . . . No-one better than he has grasped its modest beauty, the depth and force of its emotion or the immediate freshness of its feeling. . . But that was not the end of his curiosity: he aimed to go further, to discover in what sense a humble piece of rustic verse is "poetry", in short, what "poetry" consists of and what the subject-matter of poetry is. . . .

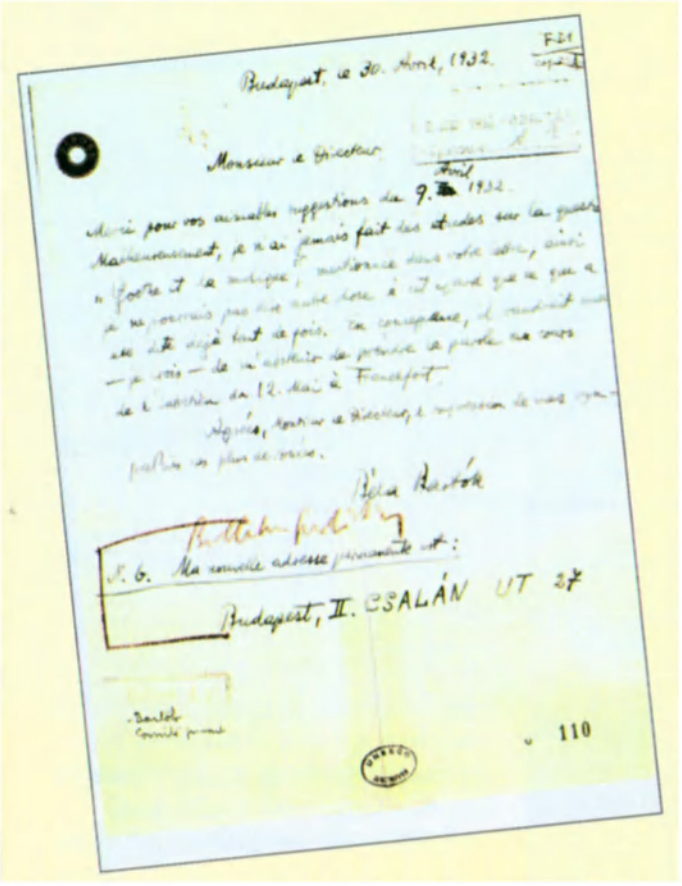
For [Goethe] there is really only one genuine, true poetry. It is exclusive neither to the people nor to the nobility, no more to kings than to peasants. Anyone who feels himself a man in the full sense of the word will practise it successfully. . . .

Imperceptibly, stage by stage, starting with an interest in folk poetry, Goethe in the last years of his life arrived at the grandiose idea of humanity reconciled in the worship of beauty, more mindful of what unites the human family than of what divides it. Eckermann quotes a comment by the poet dated 5 July 1827: "I cannot think of a column or monument to the memory of a remarkable man without seeing it toppled and trampled under the hooves of future warriors." This vision is unforgettable, of regiments destroying and dragging through the mire men's reminders of the lofty deeds of the greatest of them. Goethe the realist hated war. He speaks of it not mawkishly, nor in its cruel, distressing, blood-curdling aspect, but in its absurdity. He sees only one cure: the union of mankind through thought and feeling, through learning and literature.

GEORGES OPRESCO

SOME men give us an idea (or an illusion) of what the world, especially Europe, could have become if political and intellectual power had intermingled, or at least had had less distinct relationships. . . .

I see some such men as appearing in



Budapest, le 30. Avril 1932.

Monsieur le Directeur

Avril 1932

Béla Bartók

Budapest, II. CSALÁN UT 21

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A letter written by Béla Bartók on 30 April 1932 to the director of the International Institute of Intellectual Co-operation. In it he declines an invitation to speak on "Goethe and music" at Frankfurt on the grounds that he has not "studied the question".

the twelfth and thirteenth centuries. Others gave rise to the fire and splendour of the Renaissance. The most recent, born in the eighteenth century, took with them when they passed away the last hopes of a certain civilization founded primarily on the myths of Beauty and Knowledge—both created or invented by the ancient Greeks.

Goethe was one of these. I say at once that I can see none after him. . . . I was thinking of trying to build up, starting from him, the general idea of what I call a "universal" man—not to be confused with a "great" man. There are plenty of great men; they are not all universal men, and perhaps not all "universal men" are "great men" in the sense in which we use these terms.

. . . I thought that universal men would be principally those individuals seemingly relatively free of chronological, ethnic or national peculiarities. There are some personalities whom we can imagine being at home in any age and among any people and only accidentally belonging to the race that is their own. . . .

So Goethe is an example—perhaps the last to my knowledge—of those men whose mind and even whose character in a sense call for a much wider formula than the usual one by which other individuals are constituted. A *Goethe* molecule is extraordinarily more of a compound than a *Schiller* molecule or a *Byron* molecule. . . . Had I looked for other types of this kind, I would perhaps have had difficulty finding any as representative as the one that suggested to me this appellation. As I have said elsewhere, it is obvious that *Napoleon* belongs to the same species, and that *Caesar* is another member of it. . . .

Goethe effortlessly takes his unique, unrivalled and commanding place in the world of the intellect; and he occupies it so manifestly—or rather creates it, prescribing the conditions for it by his very existence—and so much as a matter of course that the 1808 summons to and meeting with Napoleon were bound to happen, as though pre-ordained by some conjunction of heavenly bodies: a summons and a meeting that were almost too devoutly to be wished, too clearly intended to be a wonder, too obviously obeying the command of poetic destiny. . . .

Goethe never forgot this interview, certainly his greatest memory and the jewel in the crown of his pride. . . .

The empire that was built on intellect in action and the empire of the intellect in freedom beheld each other and talked together for A MOMEN . . . and what a moment! . . . A moment which of its own accord spoke the fatal words of the covenant to the Emperor: STOP ME . . . I AM SO BEAUTIFUL. . . .

They talked of literature. Werther and French tragedy served to pass the appropriate time. But something quite different was at stake. . . . Coquetry is essential for such an interview. Both men set out to appear at ease and smile as they see fit. Here were two enchanters seeking to charm each other. Napoleon made himself emperor of the Mind, even of Letters. Goethe felt himself portraying Mind itself. Perhaps the Emperor has a more precise awareness of the real essence of his power than Goethe imagines.

Napoleon knew better than anyone else that his power, more than all the world's powers, was a strictly *magical* power—a power of Mind over minds—an aura.

He said to Goethe: You are a *Man* (or he said of Goethe: There is a Man) . . . that is to say, *a measure of all things,* that is to say, a being next to whom the others are but sketches, fragments of men, hardly men, since they are not the measure of all things as we are, YOU AND I. There is in us, Monsieur Goethe, a strange virtue of abundance, and a fury, a destiny to do, to become, to change, to leave nothing in the world the same as it was before.

Goethe (and this is no longer my imagination) pondered, and thought of his strange idea of the diabolical.

What a splendid Faust Part III Bonaparte would make!

PAUL VALÉRY

1. The three texts published here have been extracted from the proceedings of the symposium, which appeared in *Entretiens sur Goethe* ("Conversations about Goethe"), League of Nations, International Institute of Intellectual Co-operation, Paris, 1932.
2. Karel Capek, A. Costa du Rels, Jules Destrée, Henri Focillon, Julien Luchaire, Salvador de Madariaga, Thomas Mann, Gilbert Murray, Ugo Ojetti, Georges Opresco, Ragnar Œstberg, Roberto Paribeni, Gonzague de Reynold, N. Roll-Anker, Josef Strzygowski, Hélène Vacaresco, Paul Valéry, A.W. Wætzoldt.

Portobelo, a bridge between two oceans

by José Serra-Vega

Ramparts and watchtower of the fort of San Lorenzo.

In November 1502, during his fourth and last voyage in search of gold and a passage to the Empire of the Great Khan, Christopher Columbus took refuge from Caribbean storms in a bay in what is now Panama. As he wrote to the Spanish monarchs, it was with a fleet of "leaking ships, tattered sails, lost anchors and rigging, and very sick crews" that he arrived in this bay which he named Portobelo (fine harbour) because of its beauty and its naturally protected site.

However a century was to elapse before its favoured geographical situation made Portobelo one of the great trading centres between the Spanish colonies and the home country.

A mercantile odyssey

The fabulous riches of Peru were brought by sea from El Callao, the port of Lima, as far as the Pacific shore of Panama. They were then unloaded and carried overland to Nombre de Dios, on the Caribbean shore, where they were embarked for the perilous transatlantic voyage to Seville.

At the end of the sixteenth century, the Spaniards abandoned Nombre de Dios—ruined by the incursions of the Indians and of the English pirate Francis Drake—for the new settlement of San Felipe de Portobelo, hidden in the bay discovered by Columbus. Surrounded by mountains and forests, the new port was both easy to defend and blessed with a beach onto which ships could be hauled for repair.

Sanitary conditions at Portobelo left much to be desired. Many of the 400 or 500 men from each fleet of ships sent out from Seville died of malaria or dysentery in the months following their arrival, especially when they encountered the stifling humidity of July and August.

There were violent rainstorms from May to June, then again from July to

Inside the ramparts of Portobelo.

November, interrupted by a brief fine spell, "the little summer of St. John." The settlers complained of the intolerable din made by millions of toads and countless monkeys living in the surrounding forests. Occasionally a jaguar ventured into the streets of the town and killed a pig, a dog—or a child. Snakebites were an everpresent hazard, but the inhabitants wore trusty amulets with which to protect themselves.

Armadas and mules

Every year an armada of some three or four big galleons and a few small sailing ships left El Callao on the 1,340-mile voyage to Panama city, loaded with merchandise that had reached Lima by way of Arequipa and Arica.

The land journey of about 100 kilometres between Panama and Portobelo was highly dangerous. After two days on muleback, the convoy would arrive at Venta las Cruces, where it divided in two. The first team would embark on the muddy waters of the Chagres river, infested with mosquitoes and other insects, sailing in flat-bottomed boats rowed by about twenty black oarsmen or in pirogues hollowed from the trunks of giant trees, each of which could carry up to two tons. Part of the cargo would have to be jettisoned, ruined by the sun or the torrential rains, before it reached the shark-infested estuary, which was defended by the great fort of San Lorenzo. The convoy then continued its journey along the coast to Portobelo.

The other part of the precious cargo, particularly the gold and silver, went overland. The steep and narrow trail sometimes disappeared altogether under the luxuriant tropical vegetation. The travellers walked in Indian file, with the team leader keeping a strict eye on the muleteers, who were regarded as potential traitors. There was also danger from maroons, fugitive blacks who lived in the forests and lurked near the towns waiting to carry off the womenfolk when they came to draw water or wash their linen beside the river. They also served as informers and guides for the English who coveted the Spanish gold.

On the other side of the Atlantic, the fleet which at regular intervals left the River Guadalquivir in Andalusia for South America also divided into two parts. One set course for the Spanish Main (present-day Colombia and Panama) and the other for New Spain (Mexico).

The flagships were heavy galleons whose task was to bring back to Spain the precious metals of America. They were armed with powerful cannon to beat off attacks, whether from officially declared enemies such as the ships of the Dutch West India Company or freebooters such as the pirates of Jamaica or Tortuga Island. Their first landfall was Cartagena, a stronghold commanding the Caribbean, from which a tender sailed away at once to the isthmus of Panama, carrying mail for the Viceroy of Peru.

The Atlantic squadron usually reached Portobelo in July-August or in December-January, after a voyage of some seventy-five days, driven by the tradewinds. To avoid the September hurricanes, they had to leave Seville by 20 August at the latest.

The forts and the Fair

In the seventeenth century, Portobelo was protected by three forts: San Felipe de Todofierro, whose 100 men and twelve cannon guarded the entrance to the bay; Santiago de la Gloria, which had a garrison of 200 men equipped with thirty-two pieces

of artillery; and San Jerónimo, which stood on a promontory overlooking the sea and the port. In fact these were defences in name only, for the humidity spoiled both gunpowder and fuses. The soldiers, few in number and poorly trained, could put up little opposition to pirate attacks.

The Duke of la Palata, Viceroy of Peru, had had the forts built by a noted Italian engineer, Gianbattista Antonelli. The physical labour was provided by English prisoners, who were subjected to the humiliation of being treated as slaves.

The town of Portobelo itself consisted of two squares, a parish church and two convents, one of which served at times as a hospital, a big stone-built customs-house and about 100 houses made of wood. Outside the town lay the "Guinea suburb," a district reserved for blacks, slaves or freedmen, but this did not prevent the Europeans from visiting them during the fair.

The Portobelo fair, a great annual event lasting forty-five days, transformed the town into a gigantic market which had no equal at that time, where goods from metropolitan Spain were traded against the riches of the New World.

The sailors who came to Portobelo for the fair set up in the square a vast tent made of sails stitched together, under which they piled up their merchandise, each item bearing the name of its owner. The town filled with Lima merchants, the "Peruvian uncles" (as the Spaniards who had returned to Spain from Peru were called), and the agents of Spanish business houses on their way to Lima.

Spain sent cloth, carpets, metal tools, paper, wine, arms and ammunition; the prices were fixed by a commission representing the authorities and the traders. America offered cacao, quinine wood, emeralds, vicuña wool, copper and bezoar stones. Silver ingots were piled up inside the customs-house and even at the roadside. If the chroniclers are to be believed, there were neither brawls nor thefts.

The Portobelo fair ceased to be held in the middle of the seventeenth century, but it was long remembered with nostalgia by the Panamanian bourgeoisie for the influx of wealth that it brought.

Capture and decline

This short-lived influx of wealth inevitably aroused the envy of the Dutch, the English and the French. As early as January 1596, the famous Elizabethan buccaneer Francis Drake had tried to seize Nombre de Dios, but died from an attack of dysentery and was buried at sea.

In 1668 Henry Morgan, a Welsh gentleman turned pirate, set his sights on Portobelo. As was the custom, a pact was concluded between the members of his expedition. Each sailor would receive one share of the booty, the craftsmen (carpenters, blacksmiths, the surgeon and so on) a little more than one share each, the cabin-boys a half share, the captains two shares and the commander-in-chief—Morgan himself—five shares. There was also a system of awards and fines for courage or cowardice, and compensation for the loss of an arm or a leg.

Besides Englishmen, the expedition included Dutch, Italians, Portuguese, French, Africans, mulattos, and even a Spaniard from Córdoba. A mixed bag of ruined planters and ruffians from the backstreets of European cities, they were nevertheless well-armed with excellent French muskets and well-sharpened cutlasses.

Portobelo was easily captured after a night landing and less than half a day of sporadic fighting. The fortifications, with their faulty cannon and powderless muskets, proved useless. The pirates, who lost only eighteen men, locked up the townsfolk in the church, and celebrated their triumph with wine and with women who were dragged to the festivities against their will. Then they began roasting the residents' feet to force them to disclose where they had hidden their savings. Portobelo's wealthy traders eventually had to pay 100,000 pesos to avoid having the forts demolished as a reprisal because the royal treasury was virtually empty.

In 1739, the English Admiral Edward Vernon—with just six ships—in turn seized the wretched town, and shortly afterwards Spain terminated Portobelo's monopoly of trade with the homeland as part of a general move to liberalize colonial trade.

In any case, in order to avoid pirates, the Spaniards now preferred the land route from Lima to Buenos Aires or even the long sea-voyage round Cape Horn. Portobelo slowly declined in importance and became forgotten.

Today Portobelo is no more than a village with a few hundred inhabitants, slumbering in the shadow of its ancient forts. Its great pride is its miraculous statue of the Black Christ, sculpted from a hardwood so heavy that it does not float. Each year on 21 October, the statue is brought out from the main church and carried in a religious procession. ■

JOSÉ SERRA-VEGA,
a Peruvian engineer and former staff member of the United Nations Environment Programme (UNEP), has worked in the Indian subcontinent on technologies geared to environmental conservation.

UNESCO IN ACTION
WORLD HERITAGE

PHILATELY

The French Post Office is issuing these two stamps on the theme of the safeguard of the cultural heritage of humanity (2.80 francs: the archaeological park of Angkor, Cambodia; 3.70 francs: the National Park of Tassili n'Ajjer, Algeria). The stamps will be on sale at a temporary post office at Unesco Headquarters in Paris on 23 and 24 October. (They will be generally available at French post offices as of 25 October.) Further information may be obtained from Unesco's Philatelic Programme, tel: (33 1) 45 68 03 70.

RECENT RECORDS

by Isabelle Leymarie

TRADITIONAL MUSIC

INDONESIA.
Gong Kebyar de Sebatu.
Music and dances of Bali
Music from the World Collection
CD Buda 92531-2.

A fine recording of the *gamelan-gong* orchestra of Sebatu village made during a performance at the Paris Opera (Palais Garnier) in 1992. This ensemble of metallic xylophones and gongs, which accompanies the ancient sacred dances of Bali, is conducted by I Wayan Susila. A talented composer who draws inspiration from birdsong and other sounds of nature, I Wayan Susila makes music that reaches exultant climaxes evoking the lushness of the volcanic island of Bali.

NIGER/NORTH BENIN.
The Peuls
Music and Musicians of the World
CD UNESCO/Auvidis D 8006.

Nomadic herdsmen scattered across several countries of West Africa, the Peuls are rightly famed for their spoken poetry, their love of physical beauty and their devotion to their animals. They are also enthusiastic and talented musicians. Their music, more austere than that of the forested regions of Africa, belongs to the great Sahel tradition, in which stringed instruments and song often predominate. Like most of the world's shepherds and herdsmen, the Peuls are particularly fond of the flute, which they play with great ingenuity. The Peuls of Niger are better known than those of northern Benin, but in both countries love and the exaltation of courage and beauty are recurrent themes of their many songs.

JAZZ

RAY OBIEDO
Sticks and Stones
Ray Obiedo (guitar, keyboards), Kenny Kirkland/Rebeca Mauleon (piano), Jeff Cressman (trombone), Luis Conte (percussion)
CD Windham Hill Records 01934 10142 2

Flowing and melodious Californian music for a hot summer's night, this attractive West Coast Latin jazz is less ebullient than its East Coast counterpart. Besides Ray Obiedo, both Kenny Kirkland, a fine pianist who once played with Wynton Marsalis, and the Cuban pianist and arranger Rebeca Mauleon, are outstanding and deserve to be more widely known.

OLIVER NELSON
Sound Pieces.
Oliver Nelson (saxophone), Ray Brown (bass), Shelly Manne (drums), Red Callender (tuba)
CD Impulse GRP 11032

Recorded in New York in 1966, *Sound Pieces* is a classic from the Impulse label, which launched John Coltrane, among others. It features the inventive big band of composer and arranger Oliver Nelson, who has also written authoritative theoretical works. These arrangements are dense and colourful, with a variety of textures. Although less well known as an instrumentalist, Nelson is an expressive saxophone player whose solos display a powerful sense of structure. "Patterns", a piece taken from his book *Patterns for Saxophone* which he used when teaching composition at Washington University, shows just how the "thematic core" concept developed in his course lies at the heart of all well-constructed improvisation.

CLASSICAL MUSIC

HELENE BOSCHI
Vol I. Sonatas. Soler, Mozart, Clementi
CD Musicae Fidelis ES 9306.

A pupil of Alfred Cortot and Yvonne Lefébure, the pianist Hélène Boschi (1917-1990) here plays some little-known works by the Spanish composers Antonio Soler, who dominated his country's musical life in the eighteenth century, Rafael Anglés, Cantallos and Mateo Pérez de Albeniz, as well as sonatas by Mozart and Clementi. Delightful music to which Boschi's lively touch adds further charm.

J.S. BACH
Suites for Violoncello Solo, BWV 1007-1012
Anner Bylsma
Album of 2 CDs. Sony Classical S2K 48 047.

These six Suites for cello, here played on a magnificent Stradivarius, are among the greatest of Bach's works. Composed while he was living at the Court of the Margrave of Brandenburg, they illustrate his genius for fugue and counterpoint. Questions of technique apart, the simple and sublime sound produced by this instrument, which was made in 1701 and belonged to the Belgian cellist Adrien-François Servais, transports the soul to sacred spheres.

GLENN GOULD
The Glenn Gould edition.
Ludwig van Beethoven.
Symphony No. 6 in F, Opus 68. "Pastoral." Transcribed for piano by Franz Liszt
CD Sony Classical SMK 52 637.

It may seem surprising that Glenn Gould, who expressed a strong aversion to the technique of Liszt's flamboyant transcriptions of orchestral works for piano, should have chosen to record this transcription of the "Pastoral Symphony." His clear, slow interpretation, with a tempo that never loses its tension, is sometimes disconcerting, but—as Michael Stegemann rightly comments—"succeeds in allowing the listener to hear polyphonic textures . . . which show the work in a completely new light." An indispensable recording for Gould's admirers. ■

BOOKS OF THE WORLD

by Calum Wise

JULIO CORTÁZAR, A LITERARY ACUPUNCTURIST

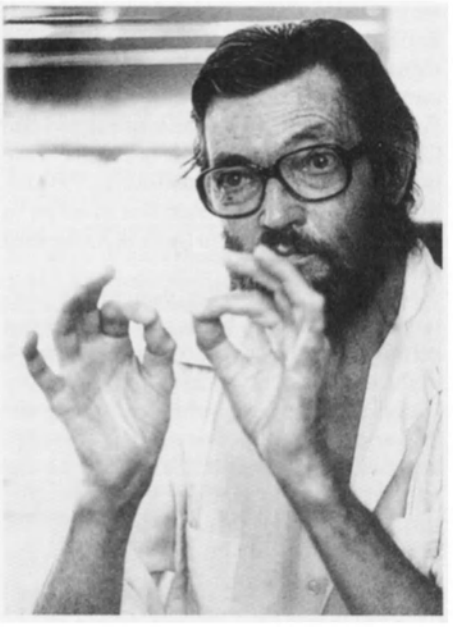
"There was a time when I thought a lot about axolotls. I went to see them in the aquarium of the Botanical Garden and spent hours just looking at them, watching their immobility, their obscure movements. And now I am an axolotl." This short paragraph, the opening passage of one of Julio Cortázar's best-known short stories, beautifully captures their narrative flow, in the course of which a transition occurs, concealed by subtle shifts of language, from one world to another.

From a starting point firmly set within a familiar context, the reader is irresistibly drawn, by a sequence of commonplace details that accumulate until they gradually change the original setting, towards some completely different destination along an apparently uneventful route. It is rather as if, setting off from home in a precise direction and with a particular goal in view, you arrive in a totally unfamiliar place.

But to discuss Cortázar's work only in terms of transgressing the rules of narrative and scrapping the conventions would be to overlook this author's greatest achievement: the creation of a multidimensional universe in which all the barriers are down, where there are only influences and gentle transitions, from life to death, from childhood to maturity, from bachelorhood to marriage—all of them cleavages that, in our everyday world, demand complex rites of passage but which Cortázar condenses to a few gentle and terribly intelligent words.

Born in Brussels in 1914, a school teacher in Argentina, settled in Paris 1952, naturalized French 1981, translator for UNESCO, admirer of the French surrealist writer Alfred Jarry, died 1984—these are the bald facts. The rest is literature—in other words, immersion in a universe where the geometry of time and of the way the world is organized obeys much more complex, flexible and shifting laws than those that govern our daily life.

This weighty 1,000-page volume—in which all Cortázar's stories are gathered together between the same covers for the first time—includes, besides some novellas hitherto unpublished in French from a collection called *Final del Juego*, (1956; 1964), a collection of short stories unpublished even in Spanish, *La otra orilla*. These twelve stories, written between the end of the 1930s and 1945, are pure as the icy peaks of the Andes and scalpel-sharp. A few will remind some readers of certain early episodes in the US television series *Twilight Zone*, and all of them carry the emotional overload that was to make all his later writings so powerful.



Julio Cortázar (1914-1984).

Over time, Cortázar's texts became more complex. The narrative structures pile up and intermingle. Some could serve as the literary embodiments of the Dutch artist M.C. Escher's visual paradoxes ("Sobremesa" for example). Cortázar's humour, present just below the surface, fluctuates between irony, the absurd, and a casual cynicism that he handles rather in the manner of Dino Risi (in *Historias de cronopios y de famas*, 1962, for example). Sometimes, however, it blows up into a storm of frightening and devastating force, like some wild scene carefully constructed by Fellini and Pasolini together, as in *Los ménades*, which describes a concert of classical music where, in essence, nothing happens beyond what the reader is capable of imagining.

Demolishing reality

The French critic Jacqueline Outin has written that "one of the problems that most preoccupies Cortázar is that of time: he wants to destroy conventional notions about it. . . ." The best example of this occurs in "The man who lies in wait," an internalized account of the downfall of a diabolically gifted cannabis-smoking jazz saxophonist, who breaks off in the middle of the best recording sessions to accuse the other musicians of playing something that he "has already played tomorrow." More than merely exploring a theme or a problem, Cortázar here shows his writer's hand for an instant and half-admits that his gigantic scheme is nothing less than that of demolishing reality. With a nuanced style and sensitivity much more subtle than the science-fiction of Philip Dick but showing the same keen intelligence (born of a hyper-acute awareness of the surrounding world) so keen that it can sometimes transfix us without our noticing, he pierces the flesh of the West at certain sensitive points in a kind of literary acupuncture of modern mythology, opening up intriguing and dizzying perspectives on the flaws in our universe.

In metaphysics as in syntax, in the writing as in the subject matter, Cortázar is an experimenter. This relationship between author and text, which has the effect of placing the reader on the stage while the writer remains in the wings, is neatly and precisely illustrated in a very short story called "Continuidad de los parques", a flamboyant—and, to the protagonist, fatal—demonstration of Cortázar's ability to twist a story around on itself, to wring the neck of all logical reasoning and to replace it by an apparent irrationality. In this trompe-l'oeil of a tale the reader passes at lightning speed from the story proper into the story within the story, which finally replaces the story and thus becomes *de facto* the story itself.

This entire volume has about it a terrible feeling of latent anguish, an elusive undercurrent running through every story—the muffled and ceaseless murmur of a nearby river from which the damp can be felt rising yet which remains always out of sight, hidden by exuberant literary vegetation. In "Relato con un fondo de agua," the vision the narrator has of his own corpse drifting gently by under the sparkling radiance of tropical moonlight is very revealing of the writer's fears of an underlying despair that, like the thinner used in tempera painting, tinges all his work. Even more revealing is his highly ambiguous way of dealing with childhood, a recurrent theme in Cortázar and one which, of all his themes, undoubtedly benefits the most from his peerless style. Mario Vargas Llosa has described that style as follows: "A style which marvellously imitates the spoken word, the fluid casualness of daily conversation, the spontaneous expression, without embellishment or pretension, of the man in the street. Of course, it's all an illusion. . . . The language of Cortázar is itself a fiction, magnificently wrought, an artifice so effective that it seems natural, a way of speaking that is drawn from life. . . ."

To enter the world of Cortázar is what it must be like to travel weightless in space:

so radically are one's perceptions overturned that one is left for a while disoriented. He and James Joyce must be the only writers who could spurn the structural limits of language and thus convey to the reader the vision of a certain field of literary and human expression where the rational becomes no more than a special aspect of the fantastic.

(This volume forms part of the UNESCO Collection of Representative Works).

Julio Cortázar: *Nouvelles* (1945-1982) Edition intégrale. Translated into French from Spanish by Laure Guille-Bataillon and by Françoise Campo-Timal and Françoise Rosset. Preface by Mario Vargas Llosa (translated by Albert Bensoussan). Gallimard, Paris, 1993. 1036 pp., 290 French francs ISBN 2-07-072913-3.

RETRACING THE SILK AND SPICE ROUTES

The general term Silk and Spice Routes covers the many trade routes which, from the first century B.C. onwards, linked the Orient and the West by a chain of posts where goods were bought, sold and bartered.

Flexible and ever-changing, these itineraries were influenced by fluctuating political circumstances as well as by the terrain, in both cases taking the line of least resistance. For more than fifteen centuries, empires rose and fell along their way, causing only temporary and minor detours. Thus from Changan (Xi'an), the ancient capital of the Chinese Empire, as far as Kashgar, the 8,000-kilometre Silk Route passed south of the Gobi Desert; then, after crossing the Pamir mountain range ("the Roof of the World"), it divided into two. Depending on the political and trading situation at the time, it either turned northwest towards the Aral Sea then back down to eventually reach Constantinople (Istanbul) after crossing the Black Sea; or it swung south of the Caspian Sea and crossed Iran, Mesopotamia and the Anatolian Plain on its way to Venice and Genoa via Constantinople.

The Spice Route was even longer, a sea-passage of more than 15,000 kilometres around the entire Asian continent. Sailing south from P'anyu (Canton) through the Yellow Sea, merchant ships steered their winding way by Borneo, Sumatra and Malaysia, then hugged the Chola and Malabar coasts of India before heading up the Gulf or rounding the Arabian Peninsula to the Red Sea in order to gain access overland to the Silk Route and the Mediterranean.

These long and often dangerous journeys through many lands and cultures can be relived in the space of some fifty pages in these two books, each abundantly illustrated with maps, photographs, engravings and drawings accompanying descriptions of the civilizations met with on the way. Mainly intended for young people, the stories they tell guide the reader through the history and geography of the subject. Each stage of the journey is described in short instructive chapters in which great events are skilfully blended in with anecdotes, human touches that bring the subject to life. Well furnished with cross-references from one to the other, the two books are written in a clear, simple style and offer a broad overview of these two great trade routes, so very different yet so inseparable from each other, which are still in use to this day, though updated to modern requirements.

A preface by Federico Mayor, Director-General of UNESCO, begins by recounting the Chinese legend of the discovery of silk, and each book includes at the back a glossary of unfamiliar names and words as well as a "Spice Routes time chart" and an index. These attractive little volumes form part of the "Integral Study of the Silk Roads: Roads of Dialogue" project which UNESCO launched in 1987.

THE SILK AND SPICE ROUTES
***Exploration by Land*, by Paul Strathern. Belitha Press/UNESCO, 1993, 50 pp., 72 French francs. ISBN 1 85561 160 0 or (ISBN UNESCO) 92 3 102761 1.**
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